AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

Vol. XLI
Number 20

PUBLISHED WEEKLY AT
CHICAGO AND NEW YORK, NOVEMBER 13 1919

Three dollars a year
Twenty cents a copy

ATWATER KENT

AUTOMOTIVE EQUIPMENT

Ignition,
Starting and Lighting

Atwater Kent Equipped Peerless Car

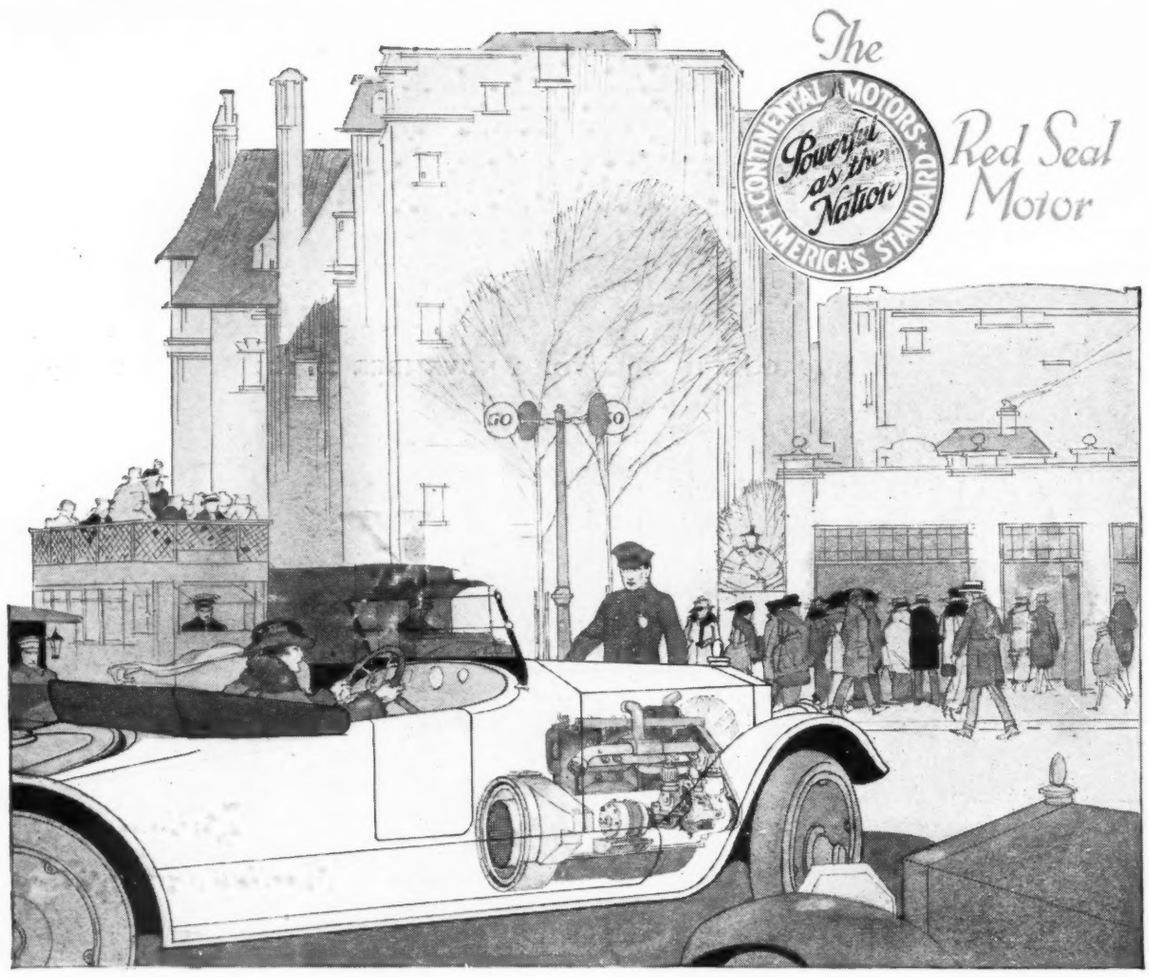
MILES from civilization, in places where the severest service is demanded of car and motor, ATWATER KENT IGNITION *continues to spark unfailingly and with maximum efficiency. Its simplicity is a warranty of continued and satisfactory operation.*

Dealers will be interested in our sales proposition.

ATWATER KENT MFG. COMPANY *Philadelphia*

4938 STENTON AVENUE

Entered as second-class matter Jan. 2, 1903, at the postoffice at New York, N. Y., under the act of March 3, 1879



Power the Instant You Need It

There's a lot of satisfaction in driving a car you know you can depend upon.

What a comfortable feeling of security you have, in the tight places, when you know that you have *power*—abundant power—the instant you need it.

Satisfaction such as this comes only to the man who knows he has a *good* motor in his automobile or truck.

For the motor's the heart of the car. Upon its performance—its power, its speed, its economy, its all-'round ability—depends your satisfaction, your security, your pride of ownership.

Look *first*, then, to the motor when you buy a passenger or commercial car. Judge the motor by its record. Judge it by the test of time—by what it *has* done, by the kind of service it *has* given throughout the years.

Apply this test—and your choice will be the Red Seal Continental Motor.

The Red Seal Continental has stood the test of time, and service—during more than fifteen years. It represents nothing untried, nothing experimental. Rather, it represents the coordinated thought of the foremost motor engineers, for more than a generation.

It is a *proved certainty*. It is America's Standard.

* * * * * * *

Today 165 successful manufacturers of automobiles and trucks, by equipping their output with the Red Seal Continental Motor, vouch for its integrity.

Upward of 16,000 dealers base their business prosperity, their business future, upon Continental-motored cars.

Hundreds of thousands of satisfied owners are living testimonial that the judgment of these manufacturers and dealers is *right*.

When you buy an automobile or truck, choose a motor with abundant power—power the instant you need it—and identify it by the Continental Red Seal.

CONTINENTAL MOTORS CORPORATION

Offices: **Detroit, Michigan**

Factories: **Muskegon-Detroit**

Largest Exclusive Motor Manufacturers in the World

Continental Motors

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLI. NEW YORK—THURSDAY, NOVEMBER 13, 1919—CHICAGO No. 20

Civilian Aviation Control Favored by General Staff

A Committee of Major Generals suggests a commission or department similar to that outlined in AUTOMOTIVE INDUSTRIES, but leaving activities of the army and navy under those departments. The assertion is made that the safety of the nation depends upon the develpment of industry. Several other suggestions are being considered in Washington and early official action is predicted

By Allen Sinsheimer

OFFICIAL Washington has awakened to the need for Government development of aeronautics. The city is seething with activities which shortly will result in the presentation of numerous bills to Congress for insuring proper protection to the aeronautic industry. Since the publication in these columns of the activities of foreign countries, together with the discussions of the need for aeronautic control in this country and the type of department best suited for this purpose, the various Government departments have shown a keen interest in the subject.

Following closely upon the revision of the Curry and New bills by their writers, which, although revised, are chiefly of a military character, a committee was appointed by the General Staff, comprising four major generals, to investigate the New and Curry bills and the general proposition of a Department of Aeronautics.

At the same time a committee was organized by the Secretary of War, at the suggestion of President Wilson, to promulgate an act which would provide for the regulation of aeronautics in this country temporarily and until a permanent Government policy for aeronautics is determined.

Coincident with this, the American Aviation Mission revised its original request for a Department of Aeronautics which would control completely all Government aviation in the United States and practically all other aviation, and has arrived at a plan calling for the establishment of a Department of Aeronautics slightly more moderate. This would embody control of all aviation, including special military air forces, but it leaves the Postal Air Service under the Post Office Department for operation, and allows the Army and Navy to operate air forces.

The General Staff Committee, comprising Major Generals C. T. Menoher, W. G. Haan, F. W. Coe and G. Snow, arrived at the conclusion that a Department of Aeronautics duplicating the plan outlined in Automotive Industries of Sept. 11, but including a procurement division for all Government departments, but not controlling operations or training in those departments, is advisable. It has been authoritively stated to Automobile Industries by the Air Service that the

In the issue of Sept. 11 of AUTOMOTIVE INDUSTRIES was printed a suggestion for a federal Department of Aeronautics, drafted upon criticisms of the bills then pending in Congress, the report of the American Aviation Mission and other recognized activities for the promotion of aviation. This article was a link in a series printed in this publlcation. The letters below indicate the reception of this suggestion by Government officials interested in the future of aviation.

"This is to acknowledge copies of your article, 'A Suggestion for a Federal Aviation Department.' The article has been read and discussed by the supervisories of the Air Mail Service and the consensus of opinion is that your plan goes directly to the point, which would be for an effective Department of Aeronautics that would foster, regulate and co-ordinate the aerial activities of the country without undertaking the operation of all Governmental activities by one board of military men." Sincerely yours,

(Signed) Otto Praeger,
Second Assistant Postmaster General.

"General Menoher has referred your articles, sent on Oct. 22, to this Group, with the request that I inform you that they had already been brought to his attention and that portions of them were considered of such value as to warrant their becoming a part of the records of a Board convened for the study of the question of the organization of the Air Forces of the United States. He has also directed that I co-operate with you and give you any assistance that the facilities of my Group may afford. As you know, it would be a pleasure to me to assist you in any way.

"By authority of the Director of Air Service."

(Signed) H. M. Hickam,
Lt. Colonel, J. M. A., A. S. A., Chief, Information Group.

"I have your letter of Sept. 4, handing me reprints from the past two issues of AUTOMOTIVE INDUSTRIES relative to the report of the Aviation Mission. I am very happy to have these papers and to note the suggestions AUTOMOTIVE INDUSTRIES makes." Cordially yours,

(Signed) Newton D. Baker,
Secretary of War.

"May I acknowledge receipt of the copy of your article in AUTOMOTIVE INDUSTRIES entitled 'A Suggestion for a Federal Aviation Department'? I shall be glad to comment on it a little later on.

"Thanking you for placing it before me, I am,

Yours truly,

(Signed) William C. Redfield,
Secretary of Commerce.

"Thank you very much for your courtesy in sending me reprints from AUTOMOTIVE INDUSTRIES covering the regulations necessary for air navigation.

"The Board of which I am a member is going over this matter carefully, and will have in the near future a rough draft of a bill to be submitted to Congress broadly covering the subject and detailed regulations to be issued by a bureau covering the matter more fully. Before anything is submitted I should be very glad indeed to have you look at it and comment on it.

"Thanking you for your courtesy, I am,

Sincerely yours,

(Signed) John F. Curry,
Colonel A. S. A.

"Upon my return to the city today from my western trip, your letter of Sept. 4, with which you enclosed reprints from the past two issues of AUTOMOTIVE INDUSTRIES has come to my attention, and I wish to thank you for your courtesy in letting me see them." Sincerely yours,

(Signed) Josephus Daniels.
Secretary of the Navy.

---

articles published in these columns previously were considered "of such value as to warrant their becoming a part of the records of the Board."

To further increase the government efficiency in aeronautics, the Secretary of War, after consultation with the Secretary of the Navy, has arranged a policy for the direction of military and naval aeronautics strictly defining the activities of each and co-ordinating those functions that can be best worked out cooperatively.

The military aeronautical activities will be restricted to those duties clearly defined by existing laws, including offensive and defensive operations in the field with the armies, general fire control and coast defense.

The naval operations will include postal stations, convoy, reconnaissance patrol, war vessels and bases operations, carrier work and offensive and defensive operations against enemy vessels and naval bases.

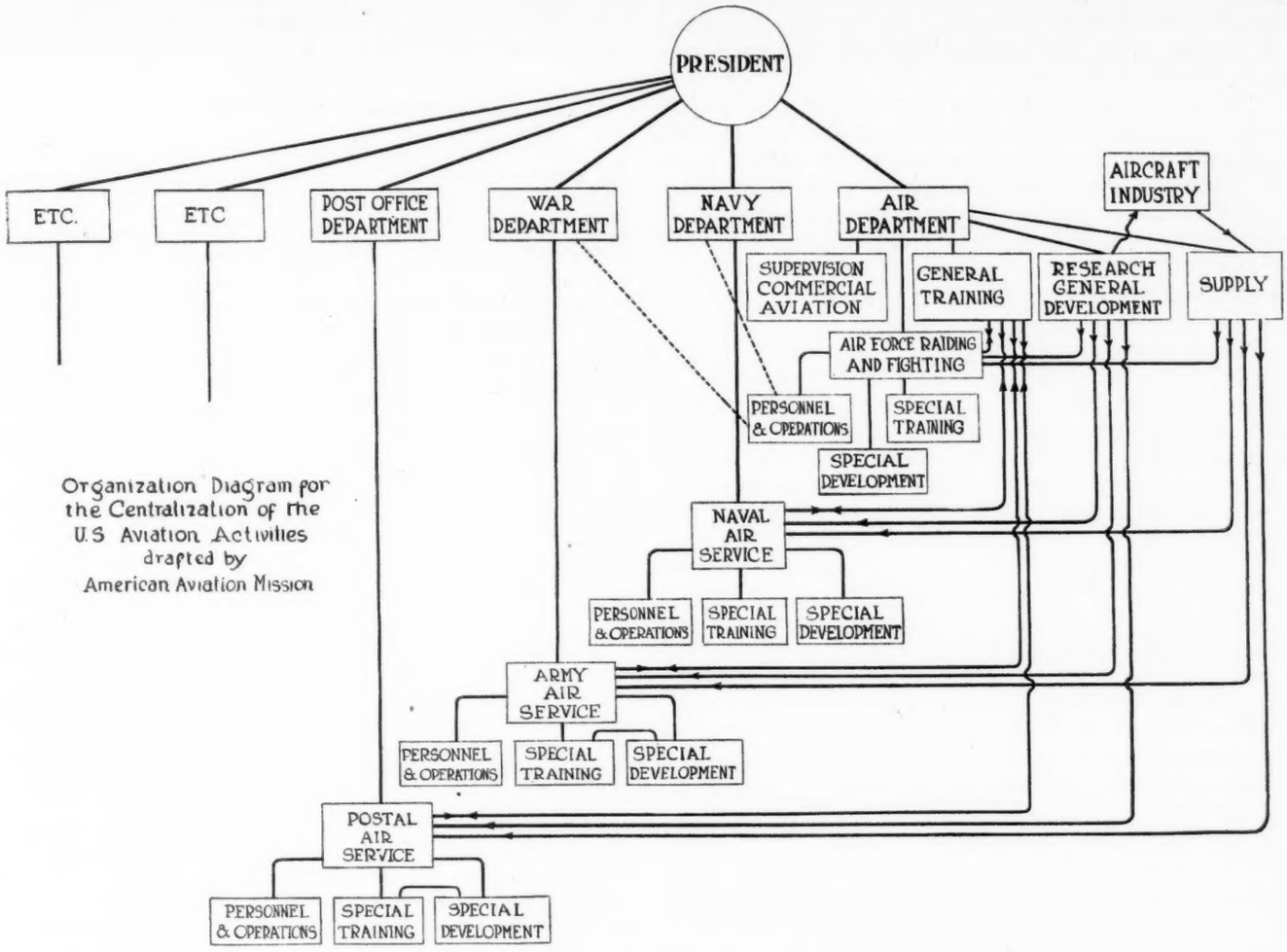
All projects for experiment stations, coastal operations, etc., where duplication would otherwise result, will be submitted to the Joint Army and Navy Board of Aeronautics, and operations will be carried out according to the dictates of that board.

All experimentation information developed by either the Army or Navy will be exchanged through the board and all estimates for aeronautics will be subject to approval by the board.

Training facilities of each service will be available to the other and, before attempting to secure types of aircraft, the Navy Department will inquire regarding them of the Army, and the Army likewise of the Navy, through the Joint Army and Navy Board.

Heavier than air-craft will be used by the Army or Navy whenever this is possible because of the greater economy in operation.

The report of the General Staff Committee made to Secretary of War Baker, just released and appended hereto in full, finds that peace-time air fleets adequate for war needs can not be maintained by any nation, but must be produced after



Organization Diagram for the Centralization of the U.S Aviation Activities drafted by American Aviation Mission

war begins, and that to provide facilities for aircraft production at the beginning of war, commercial aeronautics must be developed.

Under present conditions the only effective stimulant to the development of commercial aeronautics is Government assistance in large annual appropriations granted for a period of a considerable number of years to be continued until commercial aeronautics can stand by itself as a profitable business.

The committee declares against the production of aircraft in Government factories, in favor of a Federal agency for the adequate control of national and international aeronautics, for a single Government agency responsible for the procurement of all aircraft used in the Government service.

This procurement department is urged only to eliminate competition between the United States Government buyers and also to concentrate the purchasing power of the Government, place it in a light where it can be analyzed and maintained under appropriations that will insure continuity of an adequate aircraft industry.

The committee declares that military and naval air forces should remain as integral parts of the Army and Navy and completely under their respective controls in peace and war, and also is in favor of the maintenance of postal air operations by the post office, no matter what the decision may be as to the establishment of a separate aeronautical department or agency. It is opposed to the creation of any military air forces independent of Army or Navy control.

It recommends further the establishment of a Department of Aeronautics to regulate aeronautics in this country, to procure aircraft and to promulgate laws for the development of civil and commercial aviation. Such an aeronautic department would be headed by a civilian reporting directly to the President, and would have a board or commission comprised of one member from each Government department directly interested in aeronautics, and a civilian representing the producing aircraft industries.

The board points out that no future exists at present for the personnel of the Air Service, and recommends permanency of commission in the Air Service with similar grades where permissible as in any combat branch of the Army.

The report developed details of aeronautics in the war, quoting not only the highest British and American authorities but also those of the German Army to prove conclusively that military and naval aeronautics were so entwined with all other military and naval operations that they can not well be separated. The report of the committee was compiled after thorough

examination of numerous officers of the Army, civilians connected with the aeronautic industry, a survey of existing data and consultation with foreign representatives in this country.

The board convened by the Secretary of War to suggest legislation which would temporarily insure Federal control of aeronautics probably will submit a bill to Congress suggesting that the Secretary of Commerce be authorized, until permanent legislation is enacted, to issue licenses to all civilian pilots, exclusive of the Post Office, Army and Navy, and to promulgate regulations for the examination of aircraft pilots, engineers and crews and landing fields.

The recommendation of the American Aviation Mission, calling for a separate air force in addition to those operated by the War and Navy Departments, will meet with opposition. It is a compromise plan between that of the General Staff and the bill offered by Senator New. Senator New's bill seeks complete control of all aeronautics excepting naval, postal and military, whereas the American Aviation Mission asks for complete control of aeronautics, including the establishment of an air force independent of the Army and Navy, but allowing the Army, Navy and Post Office also to operate air forces.

It is evident from these widely scattered activities and the interest being displayed on every hand that the next session of Congress will assuredly develop a Government policy toward aeronautics that will be broader and more suitable and substantial than existing conditions.

It is hoped that the temporary legislation, which will be proposed by the board convened by the Secretary of War and which comprises representatives of the Commerce, Treasury, Post Office, Army and Navy Departments, will be enacted perhaps at this session, so that an organization may be available to insure that the individual states will not enact legislation and create a conflicting body of laws similar to those encountered by the motorists of this country.

It is also hoped that the New bill, which is the only one that has been before Congress for any length of time, will not be brought up in this session, so that it can be compared with the other suggestions and a reasonable conclusion reached.

Following is the complete report of the General Staff Committee:

Report of a Board of Officers Convened to Report Upon the New (S-2693) and Curry (H. R.-7925) Bills, Which Propose the Creation of an Executive Department of Aeronautics

October, 1919.

1. The first meeting of the board was held in Washington, D. C., on August 12, 1919. Thereafter other meetings were held at frequent intervals.

2. The board has examined many individual reports, reports of boards, commissions and other documents bearing upon the subject under consideration. It has also examined a number of witnesses orally and, in answer to its inquiries, has received telegraphic reports giving opinions of important division, corps and army commanders who actually took part in combat using aircraft as a part of their commands. Letters from military aviators advocating a separate department were sent to the board by order of Brigadier General William Mitchell, Air Service, U. S. Army, who is himself an advocate of a separate Aeronautical Department co-ordinate with the Army and Navy. These are all covered in appendices.

3. Fundamental Considerations

Practically all men who have given this subject careful consideration are agreed upon certain fundamental facts, which may be stated as follows:

(a) In future war aeronautics will play an increasingly important role, the magnitude of which will, in large measure, be in proportion to the capacity of the nation to produce aircraft and to train personnel for its maintenance and operation.

(b) On account of the short life of aircraft and the great cost of production and maintenance, no nation can in time of peace maintain military air fleets even approximating in size to such as will be necessary in time of war. Such military air fleets must, therefore, be provided after the beginning of the emergency. The nation which is prepared so that it can be the first to produce, equip and maintain a superior air force will have an undoubted advantage.

(c) If commercial aeronautics were a paying business, large plants would be established in the United States for producing commercial aircraft without other governmental stimulation than that provided for other business affairs. These plants would develop expert aeronautical engineers, expert mechanics and all classes of personnel necessary for aircraft production and maintenance. In time of war the nation's producing capacity, already organized, would be diverted from the production of commercial aircraft to the production of military aircraft. This would be a comparatively simple proposition. The nation would also have a great reservoir of commercial aviators from which, in a short period of time, military aviators could be selected and trained, and a limited portion of its commercial fleet could be utilized without radical alterations for certain war purposes. Thus, at the beginning of the war, it would be possible to develop under military control, in a most expeditious manner, probably the largest and best military air force that any nation could produce.

(d) At the present time commercial aeronautics is not a paying business; neither is there any prospect that commercial aeronautics will, in the near future, develop in any large measure by itself. Even with governmental support no definite period can be fixed, after which commercial aeronautics will be able to stand by itself. Up to the present time Congress has not seen fit to make appropriations for the purpose of developing commercial aeronautics. This is the only means by which commercial aeronautics on anything like a large scale, and hence production on a large scale, can be developed in the immediate future. The extent of such development will be in proportion:

(1) To the size of annual government appropriations, and

(2) To the period of years for which such appropriations are guaranteed. Private capital will not undertake the development of an industry based upon a single annual appropriation without any guarantee as to subsequent appropriations which will be necessary for the continued maintenance of the industry.

(e) The government itself should not undertake the production of aircraft; such action could only be justified to counteract trade combinations against the government. Competition by the government with private industry will always tend to destroy the latter. Government production may be a necessity in the case of articles of no commercial value, as ordnance. On the other hand, no sound

business reasons can be advanced for government production of commercially successful material, such as motor transport. The production of aircraft, while not yet in this class, might, by adequate government assistance, eventually come thereunder. The eventual existence of large commercial air fleets, foreseen by many, would place it entirely in the latter class.

(f) Federal agencies should be provided for the adequate control of various matters connected with aeronautics, both commercial and military. These are discussed at length in the various reports listed above, and the mention of the following most important provisions is sufficient at this time:

(1) Provision for furnishing to air fleets the necessary meteorological data similar to that now furnished by the Weather Bureau to shipping.

(2) National and international regulation of air traffic.

(3) The licensing of pilots.

(4) Inspection and licensing of aircraft.

(5) Standardization of signals and maps.

(6) Enactment and enforcement of laws relating to accidents and insurance.

(g) It is desirable that a single governmental agency be responsible for the **procurement** of all aircraft used in the government service, in order that duplication and waste may be avoided and that the producing industry of the country may be judiciously fostered in the placing of government orders.

(h) It is also admittedly desirable that a single governmental agency should be established for the purpose of development work, in so far as these matters pertain to development common to all branches of aeronautics—military, naval and commercial. This agency should be provided with the means for carrying on experimental and research work and for testing materials. It should also be charged with the collection and publication of data valuable to private industry or individual inventors and, where not incompatible with inventive progress, with the standardization of material, equipment and methods of construction.

(i) Various civil departments of the government have need of aircraft in the performance of their functions and in the improvement of their service to the public. Such appropriations as Congress may provide for these purposes will serve to aid the aircraft industry, but can not produce far reaching results.

4. With the acceptance of the foregoing, there appear to be three different lines of investigation which demand further study; these may be stated as follows:

(a) In case large Congressional appropriations be made for the purpose of assisting commercial aeronautics, what specifically are the means or methods whereby this purpose is to be accomplished?

(b) Is a separate Department of Aeronautics necessary to build up commercial aeronautics and control all questions relating thereto?

(c) If a separate aeronautical department or agency be established, should it include the aeronautical service of the Army and Navy?

These will be considered in order.

5. (a In Case Large Congressional Appropriations Be Made for the Purpose of Assisting Commercial Aeronautics, What Specifically Are the Means or Methods Whereby This Purpose Is to Be Accomplished?

In order to attempt a clear conception of just what is involved in this question, let us assume that the government has obligated itself to appropriate annually for a period of ten years the sum of $300,000,000 per year for the purpose of assisting commercial aeronautics. The total appropriation for these ten years then amounts to $3,000,000,000. Just how is this to be expended?

It is impossible, of course, to present here definite estimates covering such expenditures, but not more than 10% of such appropriations need be devoted to subsidiary purposes, such as the development of the meteorological service, the procurement and publication of maps, and the various other items enumerated above under paragraph 3 (f). It will also be admitted that allotments from the annual appropriations should be made for the establishment of commercial air routes. Such projects would demand large amounts of money; they would include the establishment of landing centers with an equipment of airdromes, machine shops and personnel; the establishment of emergency landing fields between the large airdromes and the equipment of the landing centers with various means of telegraphic and radio communication or control and navigational aids.

In other words, the project may be visualized by comparing it with the building of a railroad with roadbed, stations, roundhouses, telegraph lines, etc., complete except for rolling stock; and an invitation to private capital to provide the rolling stock and utilize the roadbed, free of charge. After all this is done, and after all of the various secondary matters have been given attention, there still remains in the realm of speculation the question as to whether or not private investors would utilize the air route sufficiently to create what is being sought, namely, an adequate aircraft industry to meet the production needs of war.

If the air routes would be so utilized, then practically the entire appropriation could be utilized for the construction of such routes; if, on the other hand, the mere establishment of these routes does not produce the requisite air fleets to use them, it would be necessary to limit the portion of the appropriation used for these purposes and to retain a part of it for the purpose of rendering still more attractive to private capital the production and operation of air fleets. The further inducement necessary might take the form of direct subsidy, such as direct payment to any corporation or firm for the maintenance and service of an aeroplane and its pilot. Such subsidies have heretofore found no place in our governmental policy, but it seems more than likely that they will become necessary if we are to embark upon a program which has for its object the adequate preparedness of this country for air defense in case of war.

It is reported by the French Air Attache to the United States that in France direct subsidies are already in force. The French Government pays each company one-fourth of the price of the airplane, provided that this machine is acceptable to the Government as being capable of tendering service in time of war. The government also pays each company ten thousand francs per year per pilot as part salary for each pilot. In Great Britain the means so far employed are reported to be restricted to establishing and improving aerial routes, but the present indications give no assurance that the desired results will be attained thereby.

6. The present reported feverish activity for the development of "commercial aeronautics," of certain nations already saddled with enormous debts, under the guise of developing a new and highly lauded system of transportation is, as a matter of fact, nothing more than a new race for supremacy in armaments. The hope is expressed in the proposed treaties growing out of the World War that excessive armaments might be limited and thereby lessen the already great burden of taxation. It is not the intention of this board to deny the wisdom

of a policy which will place this nation in the front rank with regard to commercial aeronautics or a proper state of defense. It is thought, however, that this question should be stripped entirely of its camouflage and that the nation at large should be apprised of the real situation and the terms upon which it is to enter this contest.

7. (b) Is a Separate Department of Aeronautics Necessary to Build Up Commercial Aeronautics and Control All Questions Relating Thereto?

If a national policy be adopted by Congress covering a period of say not less than ten years and providing for large annual appropriations for the development of commercial aeronautics, as indicated in paragraph 5, a suitable agency for administering the expenditure of these funds is necessary. Such an agency should naturally control also the procurement of all Government aircraft and aircraft material, the development work common to all types of aircraft, and many or all of the subsidiary activities mentioned in paragraph 3 (f). The determining factor as to the character which this governmental agency should assume is the size of such continued annual appropriations. If they are to be in the hundreds of millions of dollars annually, an executive department is suggested as a suitable solution. The question of the kind of agency that should be established if the government does not accept the foregoing as a policy will be taken up in a later paragraph.

8. (c) If a Separate Aeronautical Department or Agency Be Established, Should It Include the Aeronautical Service of the Army and Navy?

It is believed that certain fundamental considerations regarding this question may be enunciated as follows:

(1) Military forces cannot be efficiently trained nor can they operate efficiently without an air force. (NOTE: The greatest deficiency of the American air force in the A. E. F. was that it had not been trained with the other combat branches of the Army. In the United States its camps were widely separated from the training camps for the combat troops. It was in no sense under the orders of such commanders. When it arrived in France it was again separated from the combat troops and came in contact with them only when it tried to help them in battle. Then it was found that neither the troops on the ground nor the flyers in the air understood how to get together in operations. Their training, therefore, had to be given them during battle, and an expensive training it was.

(The fact has been generally overlooked in all discussions that the training of the other combat branches and liaison services of the Army cannot be completely given without having available during their entire period of training air forces, not only flyers but ground troops. It is just as important for all these forces to be trained with the air forces as it is for the air forces to be trained with them. This was clearly illustrated in some of our divisions in France who had been carefully trained in everything except working with air forces before they went into battle. When they went into battle this raining had to be given during battle, and it was a larger and more difficult problem and required a wider and greater effort to train the other combat branches to work with the air forces than it did to get the air forces to understand their method of working with the ground combat troops. The problem, therefore, must be looked upon from both sides.

(The military fighting unit, composed of all arms, can not be completely trained without having all arms, including air forces, as a part of it, because the training of each of the arms depends so largely upon its understanding of the powers, limitations and duties of the other combat branches in the final team which makes the fighting unit. Such complete teamwork can not be brought about unless during peace as well as war all the elements which constitute the fighting unit, no matter how large that unit may be, form integral parts thereof and are constantly under full military control.)

(2) An air force acting independently cannot win a war against a civilized nation nor by itself accomplish a decision against forces on the ground.

(3) With respect to an army, an air force is an essential combat branch and forms an integral part of that army as do the other combat branches. To insure success, the air force must be controlled in the same way, understand the same discipline and act in accordance with the army command under precisely the same conditions as do the other branches.

(4) In order to establish the control in battle, as outlined under the preceding section, the air force, equally with the other branches, must fully understand its exact functions in working with them. It must know their needs. It must be in full sympathy with them. It must think in the same military atmosphere and have the same esprit de corps. Such conditions can not be brought about in any force unless it is an integral part of the command, not only during battle but also during its entire period of its doctrinal training. It must be a part of such command in fact and not a temporary attachment thereto.

(5) The foregoing apply equally to the Navy in practically all respects.

COROLLARY—Whatever may be the decision as to a separate Aeronautical Department, the military air force must remain under the complete control of the Army and form an integral part thereof both in peace and war.

9. This question stated at the beginning of paragraph 8 is perhaps of equal importance with the question as to the policy of the government regarding national appropriations for the development of commercial aeronautics. It differs, however, from the latter question in one important particular. The policy of the government with respect to preparedness and appropriations for that purpose is distinctly one regarding which the nation must rely upon Congress to furnish the proper solution.

On the other hand, the effective organization for a proper defense is purely a military question and, while the ultimate authority for such an organization must be derived from Congress, it is assumed that in reaching its decision Congress would desire the opinions of experienced military and naval men. Generally speaking, military men of all armies who have had the widest experience in the study of problems of national defense and who during the world war were responsible for the successful conduct of large military operations, combining all means of combat, including aeronautics, are practically unanimous in the opinion that military aeronautics is in all respects a part of the army, and that to transfer it to a department independent of the Army would seriously effect the efficiency of the nation's combined forces as a fighting machine.

Opposed to these views will be found the opinions of a certain number of military aviators. These adverse opinions have been given the most careful consideration. They carry on their face, however, limitations of vision regarding the great problems of the combination of all arms to accomplish decisive results. As technical experts in technical matters their views should be decisive; but even in the broader problems of commercial aeronautics

itself it is to be observed that the aviator does not determine general policy—business managers, financiers and executives who have studied the general power and limitations of aircraft are the men who determine upon and carry out the broader questions of policy.

10. In further support of the fundamental considerations stated in paragraph 9, the following quotations are submitted:

Sir Douglas Haig, Commander-in-Chief of the British Expeditionary Forces, in his final report, when speaking of airplanes, tanks and other mechanical devices, says:

"It should never be forgotten, however, that weapons of this character are incapable of effective independent action. They do not in themselves possess the power to obtain a decision, their real function being to assist the infantry to get to grips with their opponents. To place in them a reliance out of proportion to their real utility; to imagine, for example, that tanks and airplanes can take the place of infantry and artillery, would be to do a disservice to those who have the future of these new weapons most at heart by robbing them of the power to use them in their best effect."

General Ludendorf speaks as follows:

"In order to provide aircraft support for the infantry, special battle **aeroplane flights** were formed. As had hitherto been done by individual airmen, they dived down from great heights and flew along at a low level, attacking with machine guns and light bombs the infantry lines, the artillery and, as the practice extended, the enemy's reserves and transport columns, as well as columns of troops coming up from further in rear.

"**Airmen as Line Fighters.** Originally intended to be an 'Auxiliary' arm to the infantry, these battle flights were finally given important tactical tasks. Thus the air force gained a new field of activity of the greatest importance. The airmen, in the course of their duties, were not only reconnaissance troops who had to fight; they were not only bomb carriers for destructive work far in the enemy's rear, but they had, like **infantry, artillery and all other arms, to take part in the fighting on the ground.**

"**Like other combatant forces,** they were a destructive arm in the great battle on land. This, indeed, became their **main** object, and the aerial combat was only a means of attaining it."

The board appointed by General Pershing, consisting of seven experienced officers, of which Major General Joseph T. Dickman was president, reported on the tactical operations of air forces and the development of air forces as follows:

"(1) **Development.** Tactics—The Air Service developed along the following general lines:

"(a) Observation, contact and artillery registration.

"(b) Distant reconnaissance and bombing operations.

"(c) Aerial combat.

"(d) Combat against ground troops.

"(2) All four of these functions will continue in the future and increase in scope. However, the last is susceptible of greater development. The combat against ground troops did not become noticeable until 1918, and did not reach its maximum capabilities by the end of the war. This class of aerial work can be made more efficacious and decisive than the distant bombing operations and should receive the greatest attention.

"(3) In order to successfully combat this form of aerial attack, there appears to be no reason why an efficient and extensive **counter-aerial** service should not be developed. Hand in hand with the foregoing, there must be a security aerial service, i. e., a service for the protection of the ground troops from aerial attacks.

"(4) The intimate association required between the ground troops and the aerial units assisting or operating with them demands that these two elements be an integral part of the same command—and as a consequence, the corps and divisions must have air units regularly assigned to them. These units must move with them, and be considered just as much a part of the corps and division as the infantry, artillery and other arms.

"(5) On the other hand, the aerial forces required for distant or strategical reconnaissance and bombing operations need have little association with the ground troops. The system of concentrating in the army troops all protection, reconnaissance and bombing units, has not met the battlefield needs and will be obsolete with future development.

"(6) Our experience, then, can be summarized as follows:

The air service development, organization and utilization should be:

(1) Reconnaissance, contact, observation and registration units to be integral elements of divisions and army corps.

(2) Tactical combat and bombing units, and battlefield security service units, to be integral parts of the army corps and the army.

(3) Strategical, bombing, reconnaissance and combat units, to be elements of the army troops."

"(7) **In general.** Nothing so far brought out in the war shows that aerial activities can be carried on independently of ground troops to such an extent as to materially affect the conduct of the war as a whole. It is possible, perhaps, that future wars may develop aerial forces of far greater extent than those provided in this war. It is safe to assume that air forces will not be developed for war purposes to such an extent as to largely supplant ground and water forces until such proportion of the people become airfaring people as now are known as seafaring people. In other words, aerial activity must bear much the same relation to the commercial life of the nation as at present seafaring activities bear to public trade and commerce.

"(8) There are two factors for the present which must be considered: First, the expensiveness of the material and the provision for its special maintenance. If it becomes possible to use in a war only aerial forces, the matter of expense is not a paramount question. But if, on the other hand, it is necessary to maintain ground and water forces for the war, then the expense of aerial forces must be considered and the aviation provided must bear its proper relation to the other forces.

"(9) Second, the question of a superior command must be considered. If a war should take place where only aerial forces are used, question of authority between ground and air forces naturally would not arise, because the superior command would rest in the proper air commander. When, however, ground forces are to be used, and so long as present conditions prevail, we believe ground forces will continue to be the major part of those provided, the authority must be vested in the commander of the ground forces, and aviation must continue to be one of the auxiliaries of the principal arm, the infantry. For the present, all question of air tactics, air strategy and employment of aviation must be governed by the well known and established principles of military art. Superior officers must be so thoroughly well grounded in the fundamentals of war that this important auxiliary will be used always in pursuance of the paramount object."

Captain H. C. Mustin, U. S. N., in his report to the Secretary of the Navy, based upon his observations as a member of the American Aviation Mission, states:

"In both France and Italy it is believed that the scope of an air ministry should not include control of military

and naval aviation personnel and operations. Also it is believed that the army and navy should conduct independent training of their aviation personnel except in that time of tuition that is common to all classes of aviation; furthermore, they believe that each service should carry on the experimental aviation work that is of a nature exclusively military or naval, for that kind of work always requires the co-operation or assistance of other branches of the service it is developed for."

Captain Mustin also states that the British navy holds similar views.

A recent cable from the military attache of the United States in London reports that the offices of the Royal Air Force believe in a separate air service, but that "both the army and the navy are thoroughly opposed to plans for an independent air service, claiming that economy and efficiency in the field are only possible when air forces are under the control, respectively, of the army and navy. In the opinion of our attache, their motive is less selfish than that of the Royal Air Force. All are agreed that production and experiment should be under one head."

11. Military Air Force Not Controlled by the Army and Navy

As an argument for a separate department of aeronautics, it is frequently stated that during the recent war the British found it necessary to reorganize their air service and to place the British army and navy air forces under an air ministry. Parts of this combined force were assigned to work with the army and navy, while a third part constituted an independent air force controlled by the Air Ministry in London. It is a matter of common report that this British policy was adopted for political rather than military reasons. The British Air Ministry was not established until 1918. The excellent record made by the British air service during the war was not the result of the establishment of this air ministry. Those give some credit to the Air Ministry for regulating production and distribution of available aircraft material. Other than this, the Air Ministry, as such, accomplished little of value. The important accomplishments under its direction were direct results of previous experience in the war and were nothing more than the completion of work begun before the creation of the Air Ministry.

It would be a serious mistake to blindly follow any system that was adopted by a European nation under circumstances such as led to the adoption of the Air Ministry in Great Britain.

As a concrete instance of the dangers of following European methods and policies without giving them careful study may be cited the fact that after General Pershing had studied the operations of the European allied armies who were at grips with the enemy in stabilized warfare, he was from the beginning convinced that the correct training of our army was to prepare that army for offensive operations in open warfare or warfare of movement. Under this doctrine the American army was trained. General Pershing constantly emphasized its importance. In his final instruction as he was forming his first American army, he instructed his subordinate commanders under date of July 11, 1918, that:

"1. The ultimate purpose of the American army is the decisive defeat of the enemy, and not the mere passive result of the pure defensive. To realize this ultimate purpose, it is essential that every officer and soldier of these forces be imbued with the offensive spirit."

The system of training which General Pershing adopted proved in the end to be correct, and was directly at variance with the doctrine under which the allied armies had been training. Indeed, some of our own officers had come to the belief that training for trench warfare or warfare of position was the correct method of training, and in a pamphlet issued by our War Department in 1917 for the training of infantry, we find in the first paragraph that "Training for trench warfare is of paramount importance." Upon the recommendation of General Pershing, this was promptly revoked, and we went to our traditional training for the offensive. After the great German offensive of March 21st and for which the German armies had been specifically trained, the allied commanders realized that they had been training under a wrong doctrine and were obliged during the war to change their system of training and adopt the American method.

Any independent air force not completely controlled by the commander-in-chief in charge of operations and acting without instructions from him violates the well-known fundamental principle so forcefully exemplified during the world war that "unity of command is essential to the success of military operations." Any air force, whether we call it independent or not, if controlled by the commander-in-chief, will invariably be assigned such missions as will help in the accomplishment of the great objective for which the entire force is striving. The same air force, if not operating under the direct orders of the commander-in-chief, will occasionally accomplish useful missions in assisting the general objective, but under such circumstances any assistance given to the general plan will be incidental. As a matter of fact, in the last analysis it was found that the so-called independent air force of Great Britain really was no longer independent. The chief of that force was placed under the orders of the commander-in-chief of the allied armies. It was realized that, acting independently, he could accomplish practically nothing for the success of the campaign.

12. The activities of the military and naval services come together at the coast line only, and, in the case of aeronautics, overlap to a certain limited extent. Due partly to the press of war conditions, there has been a lack of complete co-ordination of these activities resulting in some duplication of material and corresponding waste, inevitable in any war. This condition is being rapidly corrected. It is frequently stated that a department of aeronautics would obviate all such difficulties and is, in fact, necessary in order to effect the proper co-ordination of military and naval aeronautical activities. Such a suggestion for overcoming this particular difficulty takes no account of the fact that, in place of the co-ordination of only two services which have but the limited sphere of common activity (the coast line), the establishment of an aeronautical department controlling during war a military air force, independent of the army and navy, would require the co-ordination of three services instead of two, with spheres of common activity extending over the entire field of operations. Furthermore, the independent air force would tend to absorb an undue proportion of the maximum amount of aircraft that could be produced, to the detriment of effective action by the army and navy. These difficulties and tendencies, together with the duplication of staff departments and supply services, complicating the system of supply, communications and bases, would seriously handicap the offensive power of the military operations.

13. Under paragraph 7 was considered a suitable agency for the administration of funds under the assumption that the Government would obligate itself to large annual appropriations over a period of years for commercial aeronautics. The question will now be further discussed under the contingency that the Government will not adopt that as its policy.

Should the Government adopt a policy whereby appropriations for aeronautics are not so large and whereby those appropriations which are made are to be devoted mainly to the improvement of the public service departments, such as the Post Office Department, or to the Military and Naval Services, the requisite agencies for the expenditure of the appropriations are already in existence, in so far as it is a question of determining what is to be purchased.

There still remains the question of so distributing the purchases as to protect and stimulate the manufacturing resources of the nation. Competition between the purchasing departments would be directly detrimental to the interests of the Government, while entire lack of coordination would tend to disorganize the industry. This is a matter which can not be satisfactorily adjusted by a joint board on which only the departments interested are represented. In addition to their interests there is the public interest, which is concerned with the development of the producing industry. If this public interest is to be adequately conserved, a centralized agency having full power of control is essential.

The situation does not seem to warrant the establishment of a separate department. A suitable organization for this purpose would be an aeronautical commission created by the President under specific provision of law—the head of this commission to be a civilian with the title of Director of Aeronautics, who should report the action of the commission direct to the President. On the commission should be one member from each Government department directly interested in aeronautics; also one civilian member representing in general the producing industries.

This commission should have authority to employ aeronautical engineers and experts of all classes, as well as the necessary administrative personnel to enable it to perform its functions, among which should be the following:

(1) Control of all national and international questions pertaining to civil aeronautics.

(2) (a) Prepare and submit estimates for appropriations necessary in the performance of its functions.

(b) Consolidate and transmit estimates submitted by all Government departments for aircraft and aircraft material.

(3) Control the procurement of all aircraft and aircraft material bought by the government.

(4) Conduct all government development work pertaining to aeronautics except such as pertains solely to the military and naval branches.

(5) Prepare to meet in case of war the demands of the military and naval services for increased production.

(6) The commission will not control the operation of aircraft in use by any Government department.

14. Congressional Organization for Supervision of Appropriations

One of the arguments in favor of the creation of an executive department of aeronautics is that such action would facilitate the creation of a single congressional committee to handle aircraft legislation and appropriations. At the present time these matters are in the hands of three or more committees and it is difficult to secure adequate supervision of their action, but such supervision by a central committee of Congress will naturally result as to all major items if the recommendations of this board become effective.

There is no doubt that one of the sources, perhaps the most active source, or agitation for a separate department of aeronautics is the air service of the army. It seems desirable that the reasons for this be stated fully and frankly. The important reasons appear to be:

(a) A belief that it is desirable and essential to create a force for fighting purposes independent of either the army or navy.

(b) A belief that no future exists for the personnel of the air service so long as it remains a part of the army.

(c) A belief that a military air force suitable to our position in the world will not be developed under the army but that aeronautics will continue to be regarded as an auxiliary to other branches.

It does not seem necessary to enumerate or discuss the minor questions involved, but the three viewpoints above enumerated deserve careful study. We have already set forth the consensus of opinion among all military and naval men, with the exception of some military aviators, regarding (a) a military air force independent of either the army or navy.

15. Organization of Military Air Force by the War Department

With respect to the other two questions, they pertain exclusively to our own service rather than to the broader aspects of aeronautics. In so far as they are based upon the recommendations of the War Department as to the future organization of the air service in the proposed reorganization of the army, it must be admitted that they are not altogether groundless. This board is convinced that permanency of commission in the air service should be the same in all grades where it is practicable as is the case in other combat branches of the army. Compared to other activities, the period of a man's life during which he may be expected to accomplish first-class results as an aviator is short. This is an admitted fact which must be faced and which cannot fail to have an important bearing upon the question of an organization of an air force. Only a careful study, in which the best talent of the air service is utilized, can determine the maximum number of grades in which commissions should be permanent. It is not believed that the instructions to the present board require such a study, but it is thought proper that the necessity therefor should be suggested.

As to the adequate development of the air service, it is thought that the pessimism now existing would in large measure disappear if provision were made for permanency in commission in that service, a suitable organization provided, and provision made for details from the air service the same as from the other branches of the army, and especially details to the general staff and to the service schools.

16. Conclusions

(1) Peace-time air fleets at all adequate in size for war needs cannot be maintained by any nation. The great air fleets necessary for war must be produced after war begins.

(2) To provide facilities for aircraft production at the beginning of war commercial aeronautics must be developed.

(3) Under present conditions the only effective stimulant to the development of commercial aeronautics is Government assistance in large annual appropriations guaranteed for a period of a considerable number of years. If this policy be adopted by the Government, these appropriations, in order to accomplish the result desired, must be continued until commercial aeronautics

(4) The Government itself should not undertake the production of aircraft in Government factories unless

trade combinations in the production of military aircraft should eventually be formed against it.

(5) Federal agencies should be provided for the adequate control of various national and international matters connected with aeronautics.

(6) A single Government agency should be responsible for the procurement of all aircraft used in the Government service.

(7) A single Government agency should have charge of all development work, in so far as same is common to all branches—military, naval and commercial. This agency should be provided with the means to carry on experimentation and research.

(8) The military and naval air forces should remain integral parts of the army and navy and be completely under their respective controls both in peace and in war, no matter what may be the decision as to the establishment of a separate aeronautical department or agency.

(9) There should not be created any military air force independent of army or navy control.

17. Recommendations

As a result of its deliberations and conclusions, the board submits the following recommendations:

(a) That the army and navy retain as integral and essential elements of their organizations and operating respectively under their complete control all military and naval air forces that may be provided by Congress.

(b) That further study be given the question of the details of organization of the air forces for the army, bearing in mind the fact that a military air force is an essential combatant branch of the service and should, in so far as may be practicable, be placed on an equal footing with the infantry, cavalry and artillery; and that in seeking the proper solution to this problem the personnel of the existing air service should be given full opportunity for an expression of their views and an adequate voice in the final determination.

(c) That Congress be requested to decide whether it desires:

(1) To make large annual appropriations guaranteed over a period of say not less than ten years for the stimulation of commercial aeronautics.

(2) To make appropriations which are to be devoted mainly to the improvement of the public service departments such as the Post Office Department or military and naval services.

(d) If the policy indicated under (c) (1) be adopted, an executive department of aeronautics is recommended as outlined in paragraph 7 of this report.

(e) If the policy indicated under (c) (2) be adopted, a commission should be provided with personnel, powers, and duties as outlined in paragraph 13 of this report.

18. There being no further business before it, the board adjourned sine die at 11:25 p. m., October 27, 1919.

(Signed)

CHARLES T. MENOHER,
Major General, U. S. A.,
President of Board.
FRANK W. COE,
Major General, U. S. A.
WILLIAM G. HAAN,
Major General, U. S. A.
WILLIAM J. SNOW,
Major General, U. S. A.
Recorder.

Directional Wireless In Air Navigation

THE development of directional wireless telegraphy as a means of position finding in air navigation was discussed in a British Association paper by Capt. J. Robinson.

Captain Robinson began by saying that ordinary methods of navigation were not normally applicable to aircraft. When navigating a ship it was possible to lay off a course and rely on dead reckoning to give her position at any time, a check reading being made from the sun or stars whenever possible. This procedure acted satisfactorily because drift did not come in to any great extent. Matters, however, were very different with aircraft with which drift might amount to fifty miles an hour, and other methods of navigation were necessary. Of such methods those dependent on some application of wireless telegraphy were the best.

At the beginning of the war wireless navigation of this kind was worked by means of a coil fixed on a vertical axis and carried by the airplane. When such a coil received wireless messages from outside the maximum signal was given when the coil lay in the direction of propagation. When it was at right angles to the direction of propagation no signal, or practically no signal, was obtained. The size of coil which could be carried on an airplane was, of course, comparatively small and this method was not capable of giving other than very weak signals. Later the Bellini-Tosi system was adopted in which two coils at right angles were used and a more audible signal was obtained.

There were two methods on which wireless navigation of aircraft could be carried out. In the first the machine sent out a wireless call asking for its position. This was picked up by two or more stations and transmitted to a central station which worked out the position and then transmitted it to the aircraft. The second method was for the aircraft to have its own direction-finding apparatus on board. The first method was largely used by the Germans in connection with their Zeppelin raids over England. The drawback from their point of view was that the English received the messages sent out by the Zeppelins as well as the Germans did and so discovered the position of the ships. The method was obviously limited in its application and much wireless transmission was necessary to give one airship its position. It was believed that the Germans found it impossible to control more than eight to ten airships at one time in this way.

With the directional wireless apparatus fixed on the machine, the most sensitive position was when the minimum strength of signal was received. This applied to the single coil on the Bellini-Tosi system. When the coils were used on the ground they were swung to find the minimum signal in each direction and then the mean was taken. On an airplane there was considerable noise, and it was necessary to get as loud a signal as possible. There were two coils at right angles swinging on a common axis. The method was to use one coil and get somewhere near the maximum signal. The second coil was then introduced and its effect could either be added or subtracted. If the first coil was not correctly in the maximum position the second would not be in the minimum and so a signal would be heard.

To obtain as strong a signal as possible the coils were made as large as possible. They were wound on the main frame of the machine, one parallel and the other at right angles to the direction of travel. The machine was then

(*Continued on Page* 963)

New Horsepower Formulae

In this article, Mr. Heldt explains why the formulae in the various handbooks are faulty. He takes up the widely different varieties of gasoline engines and tells how to compute with reasonable accuracy the horsepower at the given speeds. The need for new formulae comes wth radically different construction of engines for aircraft, motor cars and heavy duty tanks

By P. M. Heldt

IN handbooks on automobiles may be found nearly a dozen formulæ designed to give the maximum h.p. of which gasoline engines of a given number of cylinders and given cylinder dimensions are capable. Most of these formulæ give too low value, having been originated at a time when the design of gasoline engines was far less developed than it is now. The formulæ are especially faulty when applied to high-efficiency aircraft engines.

The energy liberated in a combustion engine cylinder per cycle is dependent upon the piston displacement of the cylinder and the compression ratio, being nearly directly proportional to each of these factors—at least in the same type of engine. It has not been customary in the past to take the compression ratio into account, but in aircraft engines this factor has been increased to such an extent that it can no longer be neglected.

With a fixed mean effective pressure the horse power output is proportional to the piston displacement and to the speed of rotation. The mean effective pressure, however, will be proportional to the compression ratio only as long as the form of combustion chamber remains substantially the same. With a very flat combustion chamber the cooling wall area is much larger than with a spherical combustion chamber. However, practically all aircraft engines have their valves in the head and possess a nearly hemispherical combustion chamber, hence, if we limit our formla to this type, we can neglect the effect of combustion chamber shape.

The horse power of a cylinder is

$$HP = \frac{\pi b^2 \, l \, P N}{4 \times 12 \times 2 \times 33000} = \frac{D P N}{792000}$$

where

b is the cylinder bore in in.
l, the length of stroke in in.
P, the mean effective pressure in lb. p. sq. in.
D, the piston displacement in cu. in.

Now, it is known that with a compression ratio of 5, a brake mean effective pressure of about 110 lb. p. sq. in. can be obtained. Consequently for 1000 r.p.m. the horse power formula becomes

$$H.P. = \frac{D \times 110 \times 1000}{792000}$$

From this we may find the displacement necessary to develop one horse power under these conditions by writing

$$\frac{D \times 110 \times 1000}{792000} = 1$$

from which we find

$$D = \frac{792000}{110 \times 1000} = 7.2 \text{ cu. in. (approx.)}$$

The Liberty aircraft engine has a piston displacement of 1650 cu. in., operates (in the army type) with a 5.4 compression ratio and runs at 1600 r.p.m. On the above basis it should therefore develop

$$\frac{1650}{7.2} \times \frac{1600}{1000} \times \frac{5.4}{} = 396 \text{ h.p.}$$

This is very close to the power actually obtained from the engine.

Consequently we may establish the rule that water-cooled aircraft engines with hemispherical combustion chambers having a compression ratio of 5 develop at 1000 r.p.m. one horse power for every 7.2 cu. in. piston displacement. At other speeds and with other compression ratios the output varies in proportion.

The problem of aircraft engine horse power is a comparatively simple one because the working speeds are generally materially below the horse power peak speed. In the ordinary stock passenger car engine with valves in side pockets, the mean effective pressure is seldom more than 75 lb. p. sq. in. This corresponds to 10.5 cu. in. per horse power at 1000 r.p.m. Most of the later designs of touring car engines are capable of running up to 2000 r.p.m. without reaching the peak of their horse power curve.

It is hardly necessary to make any allowance for variation in compression ratio, because nearly all passenger car engines have a ratio of about 4.5. If the ratio exceeds this it is in very small cylinders, where the gain due to increased compression is offset by the greater relative cooling area of the cylinder walls.

Hence the rule for passenger car engines would be one horse power per 10.5 cu. in. piston displacement at 1000 r.p.m. and proportionately more at higher speeds up to the limit of the horse power which may be expected to be above 2000 r.p.m. in engines of modern design.

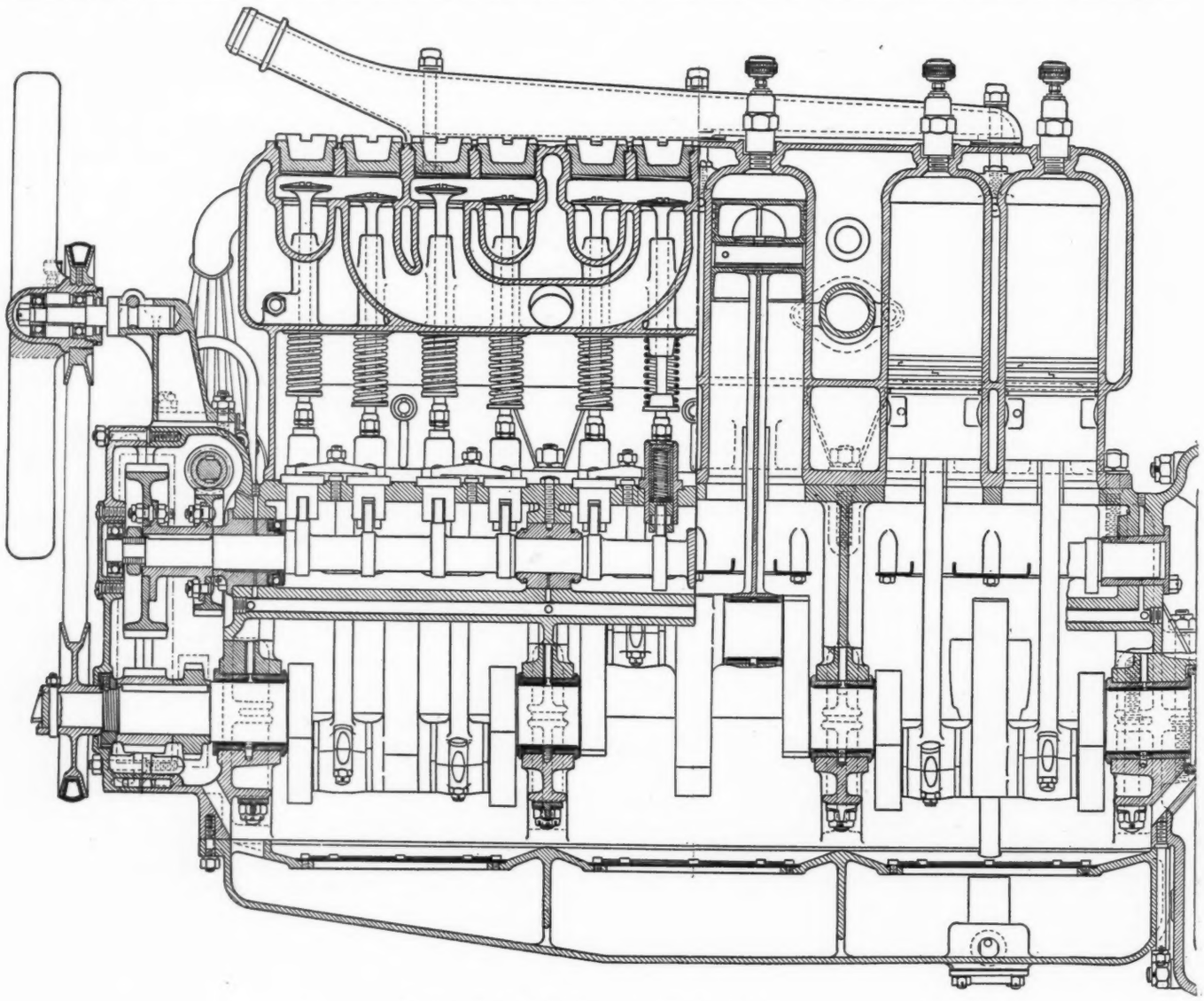
In truck engines fitted with governors the governed speed is usually below the peak speed and the assumption of definite mean effective pressure at the governed speed is therefore warranted. This will be slightly higher than the pressure in passenger car engines and one horse power per 10 cu. in. displacement may be expected at 1000 r.p.m.

Delage Offers the Only Car Built for Military Service

The unit construction and the 6-cylinder engine with gearbox is a splendid example of accessibility, there being no obstructions to reaching valve stems. The balanced crankshaft is carried in four plain bearings mounted in the upper portion of a three-stage aluminum crankcase. The chassis includes features developed in racing experience and the rear axle is the same as that which has won speed fame for the maker

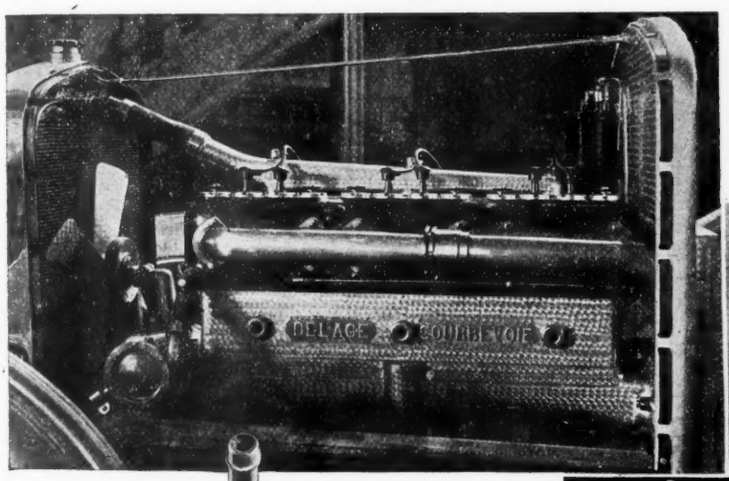
DELAGE is putting on the market a single model, a high-class six-cylinder, with front wheel brakes. This car was in production during the war for military purposes and was one of the first to be offered to the public after the armistice. Shipments are being made to foreign countries, including America.

The Delage has its six cylinders of 80 by 150 mm. (3.15x 5.90 in.) in a single casting, with valves on one side, in-

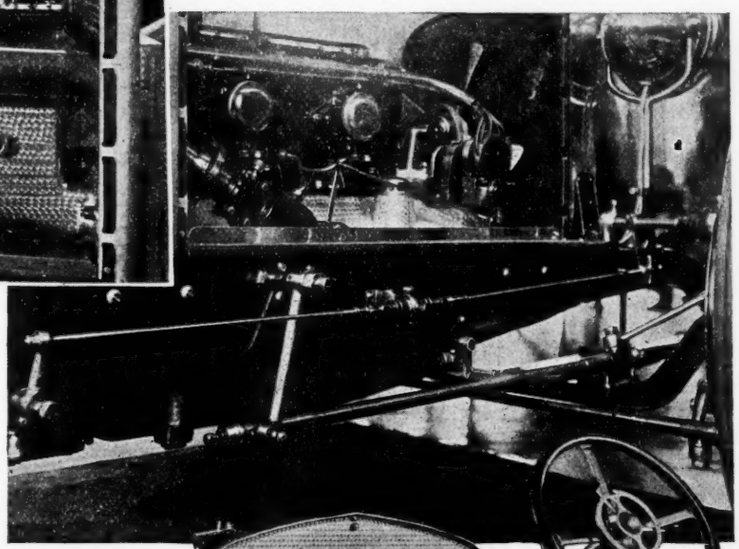


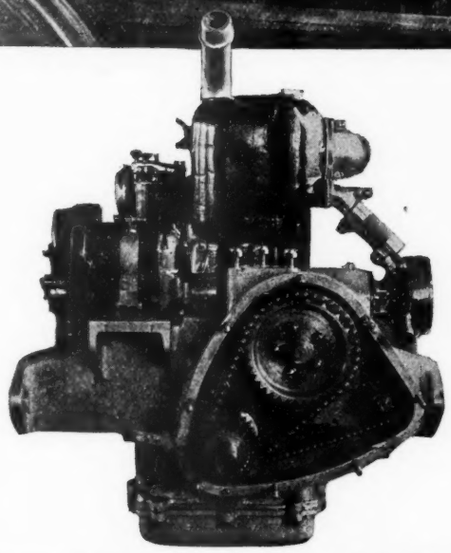
Section through Delage six cylinder engine

Interesting Features of the Six Cylinder Delage

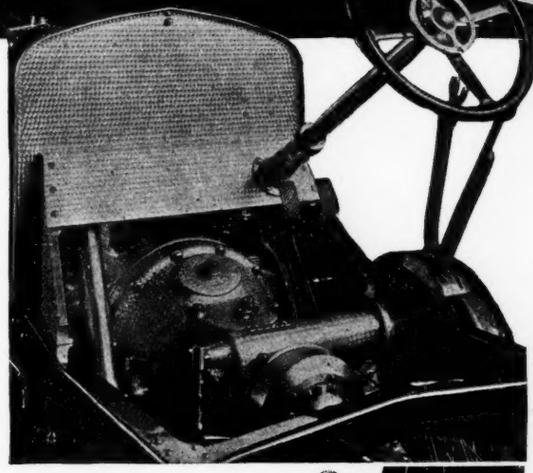


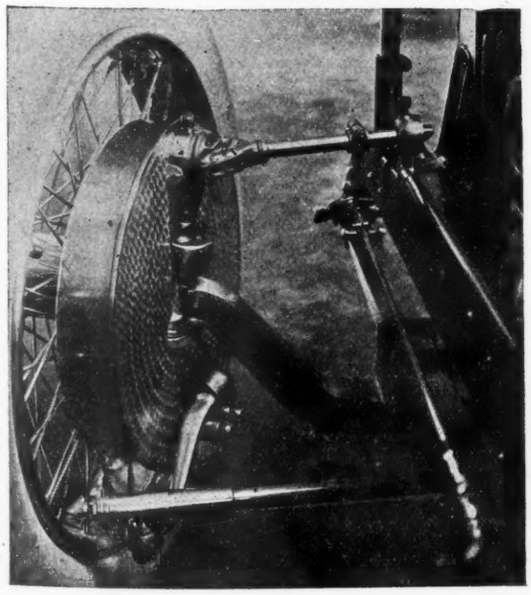
On left—Engine mounted in car. Below—Steering linkage and brake rod to front wheel brake, with ball and socket guide



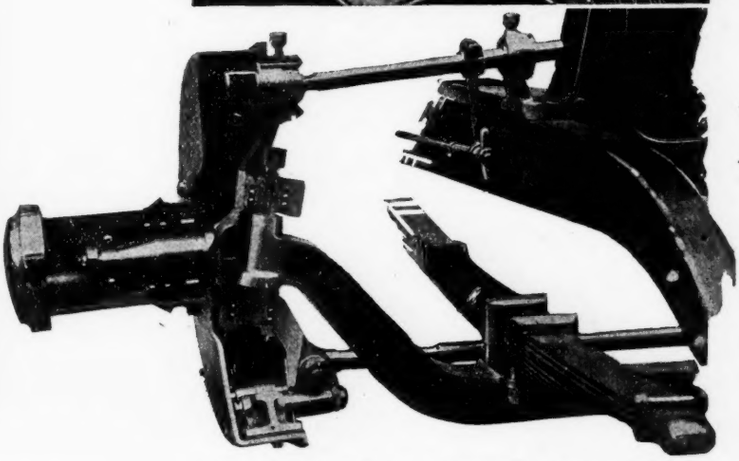


On left—Front view of engine showing chain distribution gear. On right—Mounting of control levers on transmission case



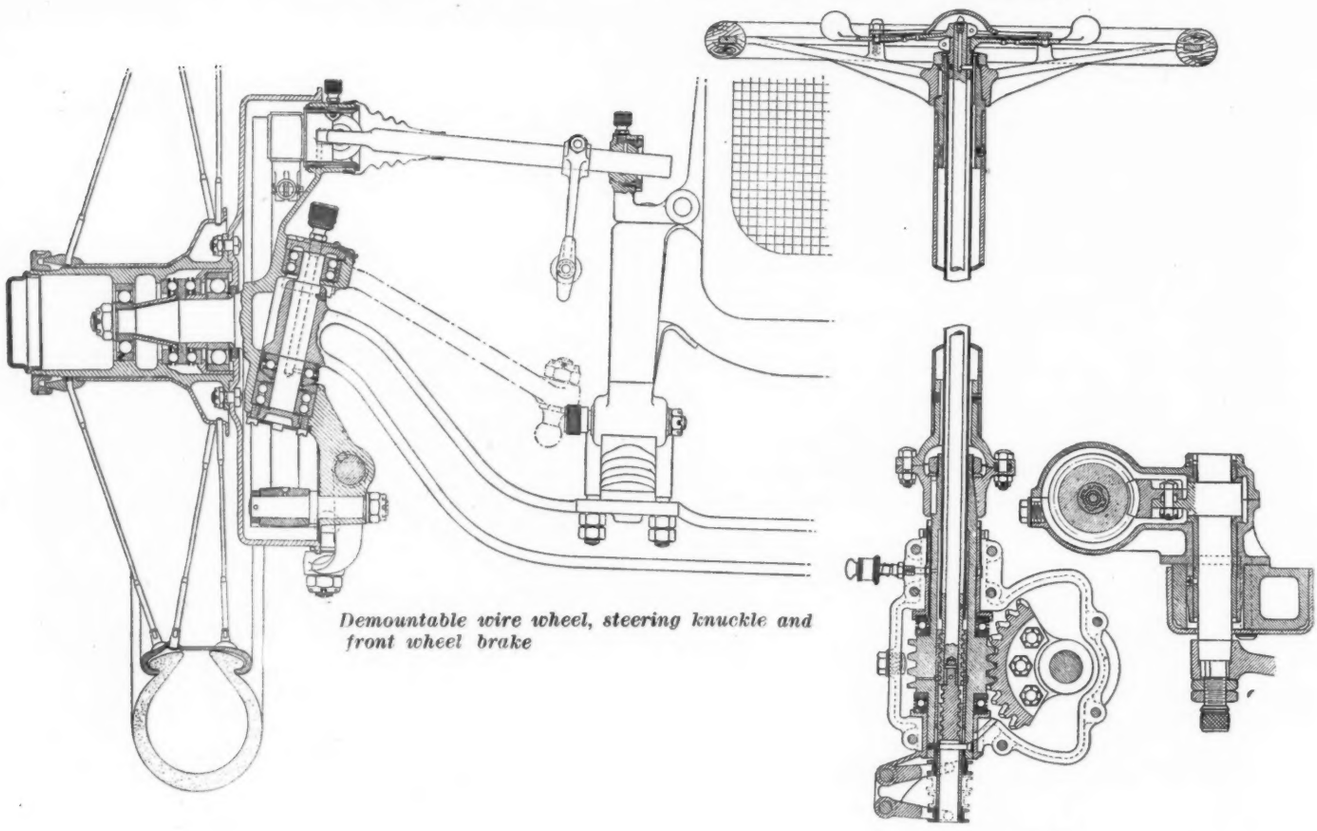


Enclosure of the front wheel brakes

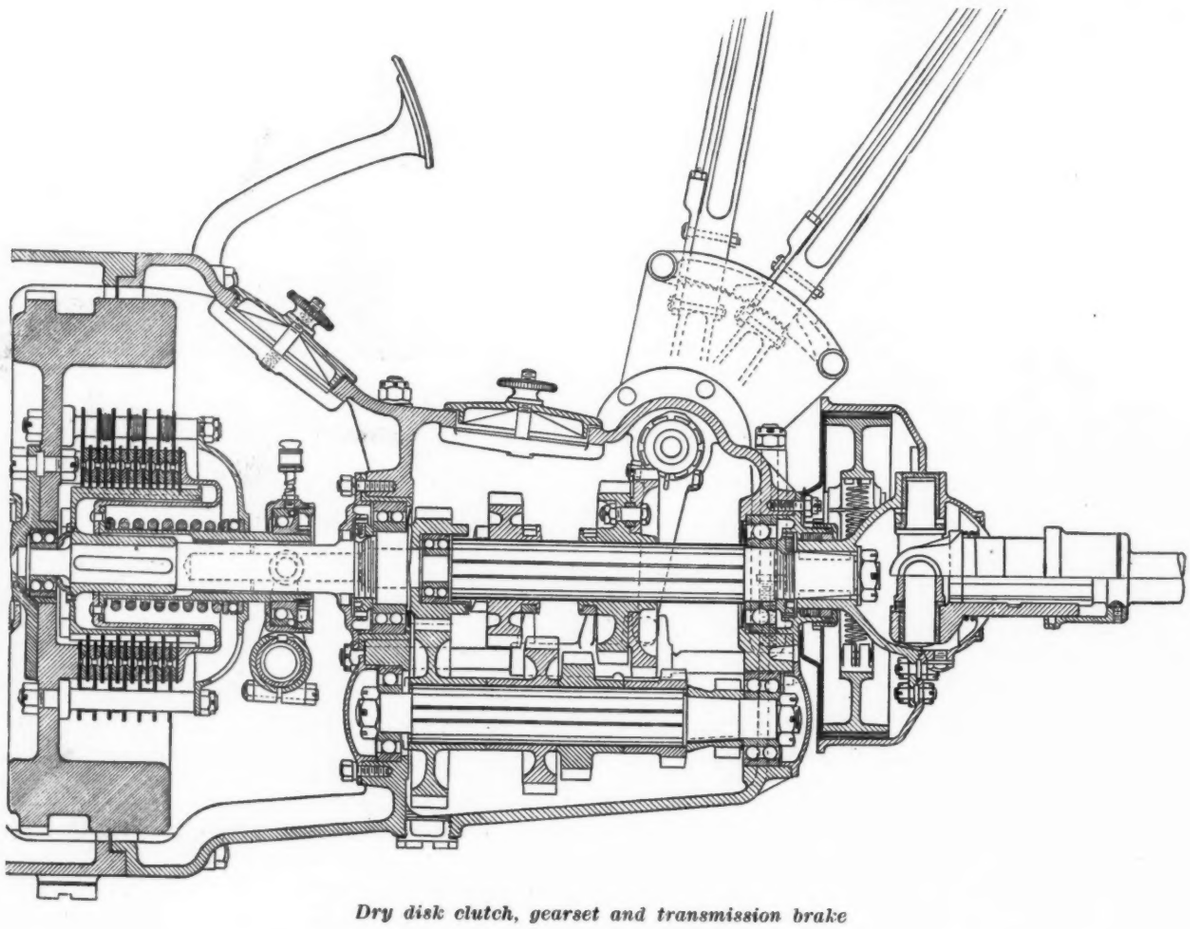


Section through front hub and steering knuckle

Mechanical Details of the Delage



Demountable wire wheel, steering knuckle and front wheel brake



Dry disk clutch, gearset and transmission brake

tegral head, and integral intake manifold. The engine is a unit construction with gearbox and has four-point suspension to the frame members. Extreme accessibility of the engine has been obtained. The valve stems are perfectly accessible, for there is no part in front of them. The electric generator and the electric starting motor are on the valve side, but they are below the valve stem chamber. The generator is driven by a Coventry silent chain from the crankshaft and the starting motor, mounted immediately behind it, engages with a gear on the face of the flywheel. A cross shaft drives the water pump and the high-tension magneto, this latter having its distributer outwards.

On the right-hand side of the engine there are two horizontal Zenith carbureters bolted direct to the block casting and fed by the vacuum system with gasoline from a rear tank. The two crankcase breathers and oil fillers, which also contain the oil level indicator, are on the right-hand side of the engine. This general layout gives complete accessibility to every part likely to require attention and at the same time makes for a "clean" engine.

Delage carries a balanced crankshaft in four plain bearings mounted in the upper portion of a three-stage aluminum crankcase. The lowest portion is only an oil pan that may be taken away without interfering with any vital part. Connecting rods of I-section construction are used and have attached to them light forged steel pistons with three rings and a hollow wrist pin. Spark plugs are not mounted in the valve caps, but behind them, in order to secure a more central position in the combustion chamber. Lubrication is force-feed type throughout, with all the oil contained in the base chamber.

Back of the engine is a multiple disk clutch and behind this a four-speed and reverse gearbox with change speed and brake levers mounted on it. Big, quick detachable inspection covers give access to both the clutch and the gearbox.

Throughout the chassis, Delage has incorporated the lessons learned in racing experience. This applies particularly to the steering, suspension and brakes. Rear chassis and taking both the drive and the torque. The propeller shaft is of the exposed type with two universal springs are three-quarter elliptics mounted under the joints.

The rear axle is the same design as that used on the racing cars, being built up of two steel tubes bolted to a central housing. The driving pinion is supported, both in front and behind, and ball bearings are used throughout. A spiral bevel gear is used. The front axle is of the closed-jaw type with considerably inclined pivots with a thrust bearing below and a double radial ball bearing both over and under the axle. The front wheels are carried in two widely spaced ball bearings with a double thrust bearing between them. Steering is by worm and sector, with a thrust bearing above and below the worm.

Brakes are fitted to all four wheels and are controlled by a single pedal. The same size shoes are used front and rear. This braking system is built under Perrot license, Perrot being a French engineer who first applied brakes to the cars built by the Argyll company, in England. Delage used them extensively for racing and has had long experience with them on touring car chassis. Close attention has been paid to details, as instances of which may be mentioned that the brake equalizer is completely enclosed and operates in grease. The brake control rods going to the front wheels are rather long and, on this account, they are supported at their central point by means of a ball and socket bracket bolted to the side frame members. This attachment is enclosed with a leather gaiter and is provided with proper means of lubrication. Brake adjustment is very simple, being by means of a wing nut level with the front of the radiator. In addition to the wheel brakes, there is a hand-controlled brake on a drum back of the gearbox.

Standard equipment of this car comprises S. E. V. lighting and starting and Rudge-Whitworth wire wheels, with 35x5.32 in. tires.

Directional Wireless In Air Navigation

(*Continued from Page* 958)

swung about when working out directions. This method had proved very useful with machines returning to the base after bombing raids or other work. The method, however, obviously had the objection that one could not set a course and keep it. The machine had to be swung about and the navigating people objected to this. To overcome this swinging out of course, moving coils had been introduced. They were about 4 ft. high by 3 ft. wide. The strength of signals obtained was not in any case very great and disturbance was caused by the magneto. These, however, were short wave disturbances (5 metres to 30 metres) and could be cut out fairly well by damping with a choke coil. The best way, however, was to screen off the whole magneto. There was further difficulty from the main frame of the machine in which there was frequently a good deal of metal. Errors due to this could, however, be eliminated by a good navigator by swinging the airplane in the same way that magnetic errors in a ship's compass could be overcome by swinging the ship.

A position worked out by a flying airplane from messages received from one station had an average error of 1¾ deg. or 20 miles in 500 miles. With messages received from two or three stations transmitting one after the other one could get within seven miles in 500 miles. Seven miles error was quite good enough for bombing work in which the machines would be flying high and could usually see considerably further than seven miles. The question of why we did not get greater accuracy than this had, however, to be considered. It was quite possible to design coils to be accurate within ¼ of a deg. A variation was found, however, even with work on the ground and interrupted or continuous waves seemed to make no difference. The variation seemed to be connected with states of the atmosphere.

At the end of his paper Captain Robinson exhibited a map of a flight from London to Paris directed entirely by directional wireless. The day was very foggy and the ground was not seen after leaving England. The map showed that a straight course was flown and the pilot forecasted correctly within two minutes when we would arrive at Paris.

CAPT. A. TARDIEU, in an address before the Franco-American Section of the Cercle Volney on the work of reconstruction accomplished by the French Government, stated that of 1,400 miles of railway track destroyed, 1,260 have been repaired, and of 670 miles of canal destroyed, 450 are now in working order. Of 2,160 bridges destroyed, 588 have been rebuilt, and of 550,000 houses destroyed, 60,000 have been reconstructed. Of 4,500,000 acres laid waste, 1,000,000 have been cleared and made ready for crops.

The Lawson airplane

Air Liner is Designed for Commerce

The twin-motored Lawson C-2 may be the forerunner of many giant American-made passenger and express planes. This article gives many details of the construction that has made this machine capable of carry ing its heavy load of twenty-six persons and equipment

COMMERCIAL air lines have been inaugurated recently in various European countries, including the Paris-London Farman line and the German line touching about a dozen of the largest cities of the country, utilizing the Zeppelin liner Bodensee and a number of heavier-than-air machines. The United States is not far behind, for, although no regular service has been established, its first aerial passenger liner, the Lawson C-2, which was built at Milwaukee, is now on a demonstration trip which will take it from one end of the country to the other.

The plane has been constructed strictly as a commercial and not as a war type. It has been designed to carry passengers, but by removing the seats, either mail or express or similar cargo may be transported. While considerable originality has been displayed in the design, the machine is far from being freakish. It is a twin-motored tractor, built for cross-country flying.

The main planes are of equal span and are made in seven sections, the outer being hinged to the center panels. The two lower engine panels are likewise hinged to the fuselage. It is these hinge joints and similar joints at the strut ends which are credited with the practical elimination of objectionable vibration, even with the motors "all out." There is said to be little vibration on the engine panels themselves.

Four large struts secure the top center panel to the body. This is also braced by four steel tubes running diagonally down to the body. This bracing helps to carry the drift stresses in flight as well as to strengthen the fuselage against any whipping action caused by forces on the tail. Each outer panel has two sets of wing struts. These are of laminated spruce and are socketed by hinge connections to special steel fittings. All external and internal bracing is by hard cable.

The Ribs

After tests of different forms of ribs, one was finally adopted having a high strength-weight ratio. This type of rib is cross-braced at certain points along the section according to the load distribution during flight. The ribs are constructed entirely of spruce and are I section, except at the external strut points. These, as well as the internal wiring compression ribs and the ribs at the foot of the panel, are all of the box-type. The wing spars are of the usual I section and are of solid spruce. Hardwood blocks are placed at strut connections to take the tremendous load due to the wires in machines of this size. There is much similarity between the upper and lower outer panels.

On each end of the wings (both top and bottom) are placed balanced ailerons. The balancing portion is neatly

designed so as not to project outside the wing proper, where it would be more liable to be caught and broken off while on the ground. This is accomplished by using a third spar placed between the usual front and rear spars and braced internally. The aileron control cables pass through both upper and lower wings. Each pair of ailerons are interconnected by four cables. The main load of these surfaces is not carried through the control wheels, since the lower cable runs from one lower aileron across to the opposite one. Attached to this line is a separate cable running up to the control wheels.

Tail Is Biplane Form

The tail is of biplane form, which distributes the stresses more readily. This allows a large area within a more compact space and provides a good aspect ratio.

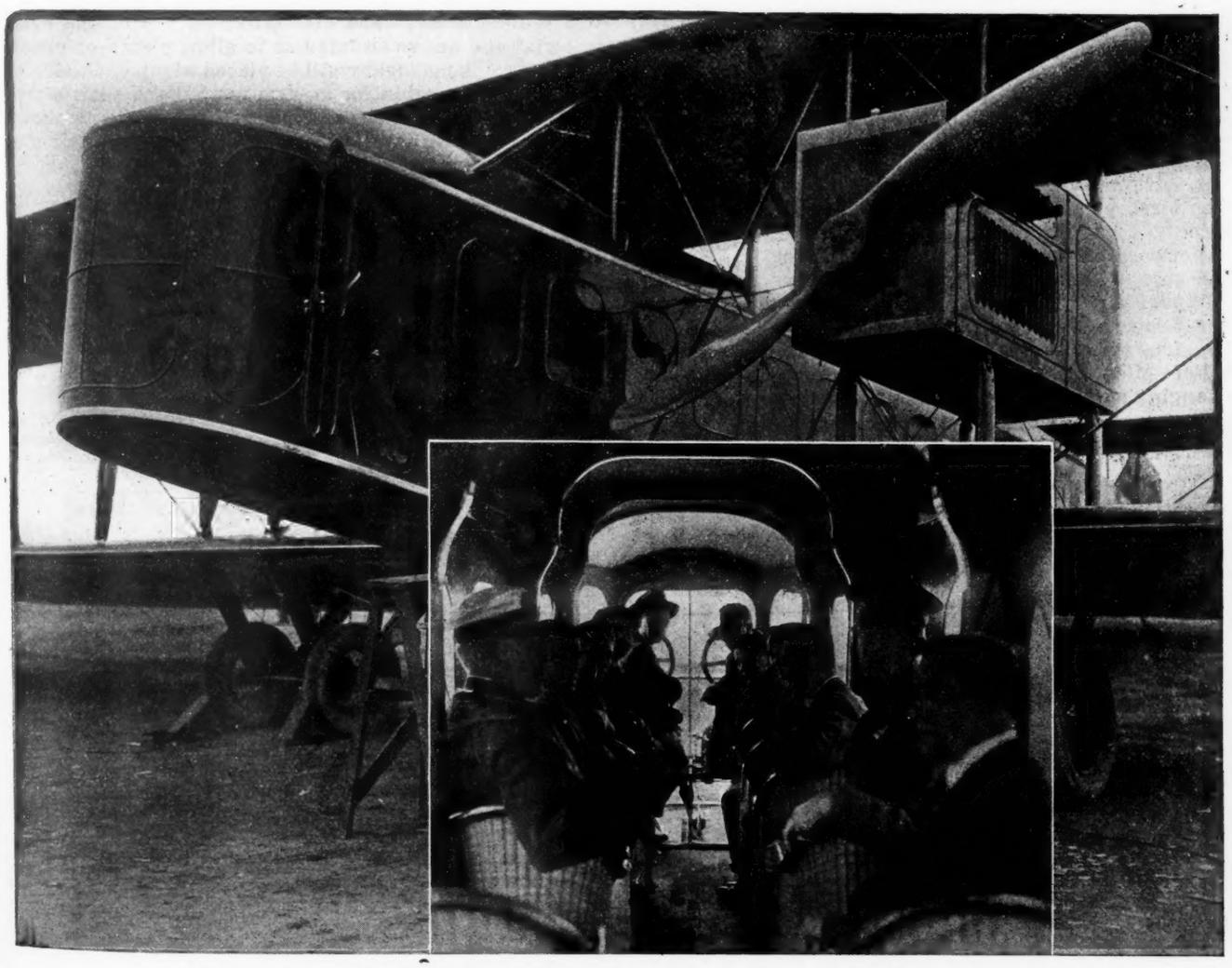
The lower plane is hinged on the front spar to a special veneer-braced strut in the body. The lower rear spar attaches to clips on the stern post.

While the struts of the stabilizer themselves are of steel tubing, the spars and ribs are constructed of wood of the same grade as is used in the main wings. The front tubes help to form the fins, the internal construction of which is entirely of tubing. The rear tubes act as pivot posts for the two outer rudders. These are of the balanced type, while the center rudder, which is not balanced, is directly hinged to the stern post and center fin. With the exception of the two outer rudders, all control surfaces are hinged by the male and female eye-bolt system. All similar controls, as in the case of the ailerons, are interconnected by cables. Only the upper stabilizer is adjustable.

The Landing Gear

A simple but outstanding feature is the landing gear. Two sets of Vees are used, one under each engine. These are constructed of heavy steel tubes faired with balsa wood (which is also used for fairing all other exposed tubes). The spreaders are of tubing and are hinged to the main Vees, thus allowing a certain amount of flexibility. Both spreaders and axle are encased in a metal streamline box. Rubber cord is used for shock absorbing and is protected from wear against the wheels or axle guide by half spools. It is strapped to an aluminum saddle at the bottom of the Vee, so designed that it prevents the cord from sliding from the original positions under any conditions. Both front and rear bays of the Vees are braced by heavy cables.

The tail skid is a large steel tube, bent so as to allow plenty of swivel movement without interfering with the fuselage. The skid is hinged to a swivel mounted in the bottom of the fuselage stern-post, which latter extends down below the lower longerons for this purpose. Rubber cord, such as is used in the main landing gear, is



The Lawson plane has a seating capacity of twenty-six. Views of the cabin are shown here

likewise used in the skid. This is wrapped around the front end of the skid and is prevented from sliding by collars welded on to the latter. On the rear end is welded a large steel shoe.

Each lower wing end is also equipped with skids. These are of hickory and so shaped as to spring in case the wing should come in contact with the ground when landing.

Body Construction Unusual

The body, the most important of all, is of unique construction and general layout. It was designed for comfort and is quite spacious.

In the construction of the body four heavy spruce longerons are employed in conjunction with struts of the same material. Cable is used throughout for bracing. The rear section, or that behind the cabin, is of this construction throughout, and is covered with linen. A turtle-deck composed of plywood formers and spruce stringers is also covered with linen. The front is wired only on the sides and bottom. However, four large plywood panels of spruce, cut out in the center, eliminate all internal cross-wiring and thereby provide a clean, clear cabin throughout. The sides are covered by three-ply veneer, composed of birch with whitewood core. The same material forms the top and bottom, as well as the nose.

On each side of the cabin are placed 16 large wicker chairs upholstered with green leather, leaving an aisle of about 15 in. Provision is made for eight more folding seats (to be placed between each pair of wicker chairs) in the aisle. This, with the two pilot seats, gives a capacity of 26 persons. When not in use, the folding seats are removed and placed in a cupboard incorporated in the rear end of the cabin.

The floor is painted green, while longerons, struts, etc., are stained mahogany. The birch panels are left in their natural color.

Forward of the passenger seats and in the nose of the cabin are two pilot seats. Although the machine is easy to manoeuver, two sets of controls are provided side by side, thus allowing the navigator or relief pilot to assume control without changing seats. However, seats are easily changed. On the flight between Syracuse and New York, the navigator and the pilot each left his seat and walked back to the rear of the cabin, where conversations were held with passengers.

Entrance is gained through a door on the left side of the cabin in the forward end. The left pilot seat is hinged so as to allow a clear passageway when entering or leaving the cabin. This is locked into position again before flight. The rear of the cabin is provided with a trap door. This is used for fuselage inspection or repairs, as well as a rear exit.

As is usual with large machines, the controls are of the Dep type and are interconnected. Centrally in front of the rudder bars is the compass. Overhead and ahead of the control seats is placed a dashboard on which are mounted the engine revolution indicators, clock lights, altimeter and air-speed indicator. On the right side of the right pilot and overhead are placed the engine switches, the air and oil gages. On the right side of the pilot seats are the engine throttles. Each pilot has a throttle valve within reach, but only the right side pilot has an altitude adjustment control. Either motor can be used at will or both at the same time.

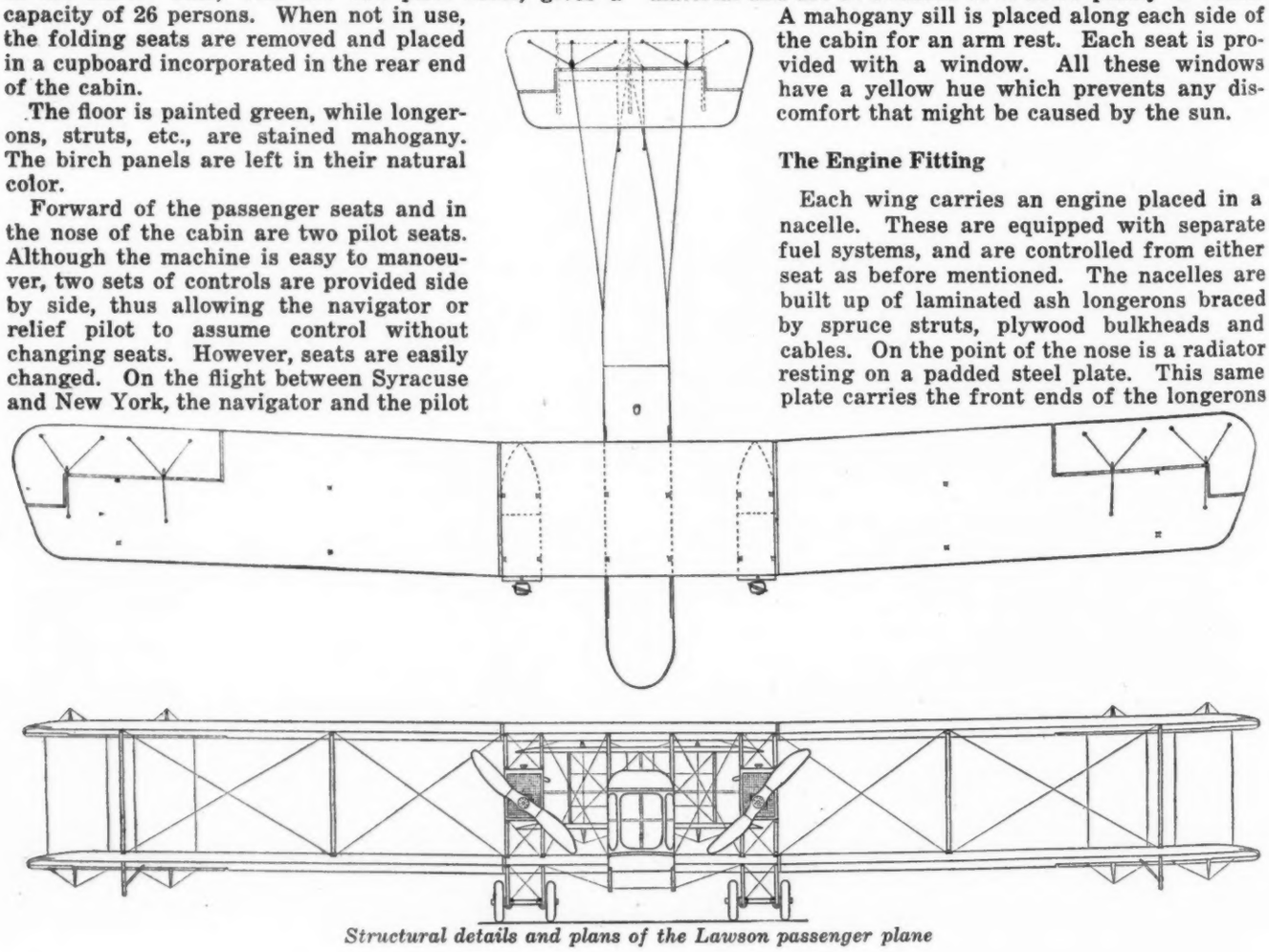
All control cables, with the exception of the engine controls, are carried under the floor. They are carried overhead and along the sides. All control cables are placed so that they will under no conditions foul anything.

A fire extinguisher is placed under the pilot seat and another one on the rear end of the cabin. Between the two seats is a large air hand pump used for starting purposes only.

The nose of the machine is composed of pyralin sheeting ⅛-inch thick. The side windows are of the same material and are so situated as to allow plenty of vision. A mahogany sill is placed along each side of the cabin for an arm rest. Each seat is provided with a window. All these windows have a yellow hue which prevents any discomfort that might be caused by the sun.

The Engine Fitting

Each wing carries an engine placed in a nacelle. These are equipped with separate fuel systems, and are controlled from either seat as before mentioned. The nacelles are built up of laminated ash longerons braced by spruce struts, plywood bulkheads and cables. On the point of the nose is a radiator resting on a padded steel plate. This same plate carries the front ends of the longerons



Structural details and plans of the Lawson passenger plane

as well as the engine beds, which are of laminated spruce and ash. Two heavy U-shaped panels come next, with a channel steel tie beam over the first. The rear ends of the engine beds are bolted by fittings to a large cross-strut in line with the rear wing struts.

Behind the engine are placed two steel gas tanks, connected together and having a total capacity of 136 gal. There is a triangular space left behind the gas tanks for tools or spares. The oil radiators, of 12 gal. each, are placed directly under each engine and behind the radiators where they will be allowed to cool. Attention is called to the fact that these parts are so distributed that a well proportioned load is placed on the front and rear spars of the wings. This also applies to the landing gears and thereby eliminates any twisting tendency of the former in case of a hard landing.

Detachable aluminum hoods cover the sides, bottom and rear end of the top. The engines are exposed overhead on the present flight, but covers are provided. There are trapdoors in the toolbox and under the nacelles, the latter for inspection and oil drainage, while large louvres are cut in the side sections for air circulation.

Of the Lawson Air Liner "C-2" Structural Characteristics

Overall length	48 feet, 0 in.
Overall height	15 feet, 0 in.
Wing section	U. S. A. 5
Area of upper wings (with ailerons)	875 sq. ft.
Area of lower wings (with ailerons)	832 sq. ft.
Total wing area (with ailerons)	1,707 sq. ft.
Span of upper and lower wings	91 ft., 0 in.
Chord of upper and lower wings	9 ft., 10 in.
Aspect ratio of upper and lower wings	9.25
Gap	9 ft., 4 in.
Chord gap	0.974
Stagger	None
Decalage	None
Angle of incidence to propeller axis	3.5 deg.
Height of propeller axis above ground with:	
1. Machine resting on ground	4 ft., 9 in.
2. Propeller axis in line of flight	4 ft., 3 in.
Angle between line from base of wheel to c. g., with a vertical line when machine is horizontal	18 deg.
Angle between line joining wheel-base and skid to a horizontal line	9 deg.
Stabilizer setting to lower wing chord (see below)	0 deg.
Stabilizer adjusmtent	—2 to +5 deg.

Areas of Control Surfaces

Ailerons (upper and lower wings)	130 sq. ft.
Stabilizers	115 sq. ft.
Elevators	100 sq. ft.
Fins	25 sq. ft.
Rudders	45 sq. ft.

Weight Schedule

Power plant (complete)	2752 lb.
Fuel and oil	2410 lb.
26 passengers and miscellaneous equipment	4002 lb.
Body (complete)	1380 lb.
Nacelles	410 lb.
Tail surfaces and bracing	325 lb.
Wing structure	2100 lb.
Landing gear	550 lb.
Total	13929 lb.

Performance (Full Load)

Weight per horse-power	17.41 lb.
Weight per square foot	8.2 lb.

Height, Ft.	Speed, M. P. H.	Time of Climb, Min.	Rate of Climb, Ft. Min.
Ground	110		
6,000	95	10 min. 9 secs.	270
10,000	90	18 min. 30 secs.	230
15,000	88	31 min. 30 secs.	110

Absolute ceiling	17,600 ft.
Landing speed	43 m. p. h.
Best angle of glide	1 in 11
Maximum climb on half throttle	435 ft. min.
Maximum speed on half throttle	60 m. p. h.

Piston Aligning and Bearing Fitting

IN refitting or scraping-in bearings, it is essential that the small end bearing of the connecting rod be absolutely parallel with the big end bearing, as otherwise the piston is apt to bind in the cylinders. A device which permits of testing the alignment of the piston and parallelism of the bearings at the small and big end is shown herewith.

The aligning tool is secured to the bench near the vise, and an arbor corresponding to the size of the big end bearing is fastened in it with set screws. The bushings are now fitted into the upper and lower part of the connecting rod, a smaller arbor being used to press them into place if necessary. The sides of the bushings are filed, so that there is enough sideplay on the crankshaft. The arbors are ground 0.002 in. under size, so as to allow for wear on the crankshaft.

When the bluing shows evenly all over the bearing, the proper thickness of shims is placed between the cap and rod, so that the connecting rod can be turned with a snug fit. It is then turned a few times, and pulled off, after which the bearing can be scraped without taking the rod apart.

In order to determine whether the small end of the connecting rod is centrally within the piston, the rod has to be put into the engine. If it is not midway between the two piston bosses, it has to be given a double bend to bring it there.

Parallelism of the two bearings of the connecting rod can be tested by means of the side straight edge of the stand, while correct alignment of the piston can be tested by means of the front straight edge. In doing this, a proper allowance has to be made for the fact that the piston is turned down to a smaller diameter at the top end than at the bottom. The tool is manufactured by John Peyer.

Babbitt Metal

THE question has often been asked whether just as good Babbitt metal can be made from scrap metals as from new metals. According to Alfred A. Greene, who recently read a paper on the subject, good Babbitt metals can be made from scrap metals, but if the same formula is used, the scrap metal alloy is not as good as one made from new metals. The alloy made from scrap metals may do the work satisfactory, because of the usual factor of safety, but although sold at a lower price, it is not necessarily cheaper. This is due to the fact that every time metals are melted, a certain amount of oxidation takes place. If scrap metals are used, the oxides are present, and in the ordinary shop practice they cannot all be eliminated. These oxides come to the top when the metal is melted, and are skimmed off in the form of dross. This means that one does not get as many pounds of metal in the bearings when made from scrap metals, as one would if the alloy were made from new metals.

The Need for Civil Aerial Transport

PART III

Having completed the introductory chapter in preceding instalments published in this magazine, the questions of personnel, production and operation are taken up. This is the third and next to the last part of this excellent report.

By Dr. W. H. Durand

IN the preceding introductory chapter the subject of air transport has been examined with reference to the various types and classes into which the general problem of transport may be divided.

From this general examination it appears that the development of air transport services generally will involve a number of subsidiary problems, the more important of which may be listed as follows:

(1) The problem of personnel for operation.

(2) The problem of material with special reference to airplanes and flying equipment generally. This will also include the problem of an airplane industry with its special problems of labor, capital, organization, administration, etc.

(3) The problem of landing fields at terminals, of landing fields en route or between terminals, and of aids to navigation such as route and location signals visible by day and by night.

(4) The problem of auxiliary transport service from landing fields at termini to ultimate destination.

(5) The general problem of legislation. This will include the following principal subdivisions:

(a) The problem of the licensing of aviators and of the recognition or acceptance of aviators' licenses equally by all states of the United States.

(b) The similar problem of an international license recognized by and valid in all countries.

(c) The problem of the classification or inspection and survey of airplanes and flying equipment, with a view to furnishing some assurance of proper design and construction, and some basis for rates of insurance against air risk.

(d) The problem of rules of the road in air transport.

(e) The problem of liability for damage done to persons or property on the ground by machines while taking the air or when making forced or accidental landings, and generally the problem of how far above the ground sovereignty over, or ownership of, or interest in the air should be held to extend.

(f) The problem of state boundaries, national frontiers and of smuggling.

(6) The general problem of the economics of air transport. This will involve a study of the economic possibilities offered by air transport for any stated or proposed class of traffic or transport and specified set of operative conditions.

(7) The general problem of the military or naval significance of aeronautics and of air transport, and of the desirable or needful relations between the military and naval authorities of the Government and private individuals, companies or organizations which may desire to undertake the development of air transport for commercial purposes.

(8) The general problem of the relation of the Federal Government to the various problems (1) to (6) and to the special questions to which they may give rise.

These general problems presented by the broad field of air transport as a factor in the economic, commercial and social life of the country, may be now briefly examined.

Personnel for Operation

As a result of war training, the United States possesses at the present time a large excess of personnel as compared with any probable need of the present or immediate future. Counting those who trained and qualified as flyers for the air service during the war, we find some 11,000 young men representing a potential source of supply. Not all of these would, of course, be available for commercial service. Many, however, undoubtedly would, and it may be fairly assumed that the personnel for any probable demand exists in abundant supply.

This will not, however, provide for the future, and one of the specific problems which must be held in view and regarding which due provision must be made, is that of insuring an opportunity for the proper training of pilots, adequate in number for the commercial demands as they may develop.

Judging the future by the past, we may anticipate the organization of private schools for the training of pilots, and with a definite demand in numbers for trained aviators, such schools would undoubtedly increase in number and capacity sufficiently to meet all demands. We have here a simple case of demand and supply. If the demand and the inducements are made sufficient, the supply will not lag far behind.

So far, therefore, as there exists a problem regarding operating personnel, it is that of training and of organization and conduct of schools adequate in number and character for the purpose.

Having in view the desirable co-ordination and the standardization of the work of such schools, it would seem proper to recommend that there should be some central committee or agency with federal status and prestige, with headquarters in Washington, and which should act as inspector of the work of such schools, and in a general way as an advisor with reference to the improvement and standardization of the training given.

Due furthermore to the close relation between the functions of such a committee and those of the authority which will determine the fitness of candidates for aviators' licenses and issue the same, it would seem desirable that the committee here proposed should either act under the authority of the examining and licensing body; or perhaps better, that the latter body should exercise also the functions suggested for this committee.

We have, therefore, the following proposals:

(1) That there should be organized under Federal authority a committee whose duty it shall be to advise and co-operate with all schools for the training of aviators, with a view to the improvement and standardization of the training given.

(2) That such committee shall either act under the authority of the body which is to determine the fitness of candidates for aviators' licenses and issue the same, or otherwise that the functions of the committee as proposed shall be exercised by the examining and licensing authority.

The Problem of the Production of Material

This involves the industrial problems connected with the organization and operation of an airplane industry. It includes primarily the problems of

(1) raw materials,

(2) labor,

(3) manufacturing plants, their organization and operation.

These problems will be only briefly considered as regards their present status and future prospects.

Here, as elsewhere and in industry generally, it is a question of demand coupled with the inducement or prospects of reward. If there exists a demand at prices which will insure adequate or attractive returns, manufacturing facilities in proportion will promptly follow. Here also, as with personnel, the war demands for aircraft resulted in the construction of manufacturing facilities far outrunning any probable immediate demand arising from the needs of civil air transport. These facilities cannot, of course, be maintained on an efficient producing basis without adequate orders. Such orders must come from either

(1) the Government for military or naval purposes,

(2) the Government for mail transport or other Federal service, or

(3) private sources for pleasure or business.

The Government has largely reduced its orders for military and naval aircraft; the demands for Government service, mail and otherwise, are increasing only slowly, and the demands for civil air transport have hardly as yet become a factor in the aircraft industry.

Under the circumstances it is inevitable that there must be a very great reduction in our present manufacturing facilities, particularly as regards organization and personnel. There will be also, presumably, some dismantling of shops or machinery or conversion to other industrial purposes. It seems plain that the demands of civil air transport at the present time, or in the immediate future, combined with governmental demands for various services, military, naval and departmental, will not serve to adequately occupy the large manufacturing facilities which had been realized in the fall of 1918. In the readjustment there must of necessity be some economic loss involved in the disorganization of personnel and staff and in the enforced idleness of capital invested in buildings and equipment. This must be accepted as a part of the price paid for war. In such readjustment, however, it is to the interest of the future of air transport that effective nuclei of personnel and staff be retained and that, in the conversion of building and equipment to other purposes, due regard be had to the possible need of a re-expansion in a future not too far removed to justify some present sacrifice in this respect.

In such industrial readjustments, the attitude of the Government toward the future of air transport in general will exercise an important, even a controlling influence and further reference to this phase of the question will be made at a later point.

Landing Fields and Aids to Navigation

Landing fields for aircraft fall naturally under two classes:

(1) Fields at terminals and intended for the purposes of landing or departure in connection with an intended stop at such point.

(2) Emergency landing fields en route and intended to serve in case of a forced landing for any cause while en route.

Fields of class (1) are to be considered as terminal stations and will require adequate provision of hangars for shelter, and also repair, supply and maintenance service with the shop equipment and facilities needful to this end.

Fields of class (2) are to be considered as an emergency provision only, and the extent to which such fields will become a matter of definite need remains for the experience of the future to determine. Naturally they will not require the same degree of surfacing as those of class (1), nor need there be, as a rule, any provision of hangar space or supply and repair service. They are intended primarily to facilitate landing and get-away in case of temporary derangement or emergency, and to this extent stand as a form of insurance on the safety and reliability of the service.

It will not be necessary for present purposes to consider in further detail the character of these landing fields or the facilities which they are intended to provide.

One important question does remain, however, and that is as to how they are to be provided and maintained.

Fields of class (1) are essentially local in their relation. They will often be placed in a park or in a convenient area in the near suburbs of a city. They will stand in somewhat the same relation to a city or town as does its railway terminal or station. Fields of this class will naturally be provided and maintained at local charge and by the cities or communities which they are to serve. With the present impetus which air transport is gaining, there seems no reason for apprehension as to the readiness of cities and towns to provide adequate terminal facilities for such air transport services as the near future seems likely to support.

The development of air transport for mails will exercise a powerful influence in connection with such provision. With the expressed desire or readiness of the Post Office Department to inaugurate an aerial mail service between two cities or including a stop at a given city

or town, the provision by such locality or localities of suitable landing fields may be taken as an assured fact. And once provided for mail purposes such fields would surely be made available for such other forms of air transport service as might develop, or for private flying, all under suitable arrangements and provisions.

Turning now to emergency fields en route between terminals, we find an entirely different condition. Here no one locality will be interested in either the provision or maintenance of such fields. They will exist solely for the benefit and safety of pilots flying along such routes. On the other hand, the situation is relieved somewhat by the very moderate facilities which are required. A level pasture lot of adequate size might be listed and used as an emergency landing field without, as a rule, interfering with its use for normal purposes. The same will be true of many areas which might be available for emergency purposes, and to this extent the provision of such fields will often require no more than a friendly understanding with the owner regarding the right to land, and including some suitable security against any damage which may be done, and also some understanding with the owner that he will not, without due notice or authority, plow up such field or in any other manner render it unsuitable for the purpose contemplated. Here, as elsewhere in the economic world, however, if the owner surrenders what he considers a right of some value, if he relinquishes in any degree his right and title to the use of such field, or if he yields in any degree his authority over the same, he will expect some valuable consideration in lieu thereof. In still greater degree will this be the case when such emergency fields are kept solely as landing fields and where they have no economic use otherwise.

In some degree, therefore, the existence and maintenance of such emergency fields will entail an expense which must be allocated somewhere.

It seems not unreasonable to anticipate that, as with public highways, counties and states will be ready here to assume what expense may be involved in the provision and maintenance of such emergency landing fields along the main flying routes as future experiences may show to be desirable.

All such emergency landing fields will be indicated on maps and charts of air routes and their existence and character noted in flying directions. It may also be found desirable to indicate by ground signals, at frequent intervals, the direction and distance to the nearest available landing field. All such matters fall under the general head of aids to navigation, and, as noted in the following section, they should come under the co-ordination authority of some committee or body with federal status. Hence the same body should exercise at least an advisory or co-operative function with reference to the establishment and maintenance of all emergency landing fields, or at least all such as are regularly listed and considered as available for purposes of air transport along regularly established air routes.

We conclude under this head, therefore, as follows:

(1) We may reasonably anticipate the provision and maintenance of landing fields, as needed, both terminal and emergency—the former by the cities or towns concerned, and the latter by the counties or states along which the routes lie.

(2) The establishment of such fields and their marking and designation should be carried out under the co-operative advice and direction of the federal body or committee suggested in the following section in connection with the provision and maintenance of general navigational aids.

In connection with the various services in which air transport may count as a factor, reference has been made to the need of a definitely organized system of aids to navigation, comprising primarily signals or marks for the identification of route or locality.

Air transport, at least for some time to come, will involve chiefly problems of daylight flying in clear weather, or at least in weather where the visibility of objects on the ground is normal. In less degree there will be involved the problems of night flying in clear weather, and in still less degree the problem of day or night flying in fog or when ordinary signals cannot be seen.

The following classes of objects will be available and suitable for daylight signals:

(1) Natural objects or features:
- (a) Rivers or streams.
- (b) Lakes and ponds or the sea coast.
- (c) Plainly distinguishable hills, mountains or valleys.
- (d) Characteristic forested areas.
- (e) Level areas with characteristic marking, as, for example, with sand or characteristic crops.

(2) Works of man not primarily intended as aids to aircraft navigation:
- (a) Cities, towns and villages.
- (b) Railroads.
- (c) Highways.
- (d) Notable bridges.
- (e) Notable buildings.

(3) Artificial markings or constructions intended primarily as aids to aircraft navigation:
- (a) Numbers, arrows, etc., painted on the tops or roofs of large buildings.
- (b) Canvas strips laid on the ground in such manner as to form recognition or route signals.
- (c) More permanent ground signals made of cement, white sand, gravel or other suitable material, and of suitable form and size to meet the requirements of visibility at reasonable flying altitudes.

Naturally, signals of classes (1) and (2) will be made use of when possible and only supplemented by those of class (3) when found necessary.

For night flying, signal lights of distinctive color are naturally indicated as the most suitable and effective. The individualization of such lights is exactly the same problem as in the case of the lighthouse and may be realized in the same manner—by color, by flashing at stated intervals or by some combination of the two.

For signals in thick weather or in fog when lights cannot be seen, sound signals are naturally indicated. It can scarcely be expected, however, that the general public would willingly tolerate periodic fog whistle or other like signals along aircraft routes as an aid to navigation in thick weather. There does remain, however, radio telegraphy, and we may anticipate for all pilots liable to be caught in thick foggy weather and perhaps for night flying generally the provision of at least a radio receiving set with which signals from known stations could be received and the sending station approximately located, at least in direction.

Next, as an aid in the use of such signals and landmarks, there will be required a series of track charts showing distances and indicating the location of all signals or available landmarks over a band of country lying perhaps ten miles on either side of the track which it is desired to follow.

Supplementary to such track charts there will also be required a set of compilations similar to sailing directions for the mariner. These will be needed for all principal

routes and for passage in each direction. This latter requirement develops from the fact that natural or landscape objects often have very different appearances when viewed in different directions, and in order to recognize an object ahead, such as a particular mountain or lake or forest area, the pilot should have a clear idea of just how it will appear from the air at his altitude and when approached in the direction in which he is flying. Such flying directions should include brief descriptions of all objects available as signals or landmarks, whether of class (1), (2), or (3) above, and when needful, accompanied by an outline drawing, sketch or photo reproduction, in order to aid in identification.

There is an open question at present as to whether such description should be given for more than one average altitude of, say, 4,000 to 6,000 feet. Natural objects, especially hills and mountains, appear quite differently at different altitudes, and for the pilot flying habitually at high altitudes, it might be that a set of directions written from that altiude would be desirable.

Experience only can determine a question of this character, and at the start the preparation of carefully prepared flying directions for use primarily at or near one altitude is quite as much as we may expect to realize.

If, then, we may suppose a pilot setting out to go from one point to another, provided with suitable track charts and flying directions, he should have no more difficulty under normal conditions in finding his way or in keeping on his course than does the automobilist, provided with his maps and guide books. Naturally, for routine service between two points, such, for example, as mail or express service between two cities, the pilot will soon learn to carry his track chart and flying directions in his head. Nevertheless, in order to place civil air transport on a definite basis as a factor in the economic, business and social life of the country, the provision of signals and landmarks and the preparation of adequate charts, maps and flying directions must be considered as an indispensable requirement.

If this be accepted, the question immediately develops as to who is to undertake such work. The following are possible:

(1) The federal government.
(2) State governments.
(3) Counties or municipalities.
(4) Private organizations or individuals.

It is clear that whoever bears the expense, there must be some central or single source of authority or initiative, or at least some co-ordinating and unifying agency in order to insure uniformity in the system of signals, in the style and character of maps and charts and in the preparation of flying directions. Again, once a signal or artificial landmark is made, it must not be arbitrarily removed or changed except with due notice, as with lighthouses, buoys, etc., marking for the mariner the approach to a harbor.

These obvious requirements seem to call definitely for some form of central control, and this will naturally be found in some appropriate division of the Federal Government.

Again, to the extent to which such aids to navigation may be convenient or necessary in connection with air mail service, to such extent the Federal Government will be interested directly in their provision and maintenance.

On the other hand, it is to be expected that much of the expense connected with the provision of such aids to navigation may be borne by the States, by cities or towns, or even by private organizations or individuals.

These considerations point to the desirability of a central general control over all matters relating to the provision and maintenance of aids to navigation, but working as a co-ordinating or unifying agency among a large number of other unit groups of various sorts—States, cities, towns, private organizations and individuals.

We conclude in brief, then, as follows:

(1) The development of civil air transport will require careful systematic attention to the provision of aids to navigation, and including in particular the use of all available objects and landmarks now existing and the provision of other special marks or signals where necessary, together with the preparation of adequate maps, charts and flying directions.

(2) Federal control over such matters should be vested in a Federal body or in some agency with Federal authority and status, but operating also in cooperation with and as a unifying agency among various other groups or organizations, political, municipal or private, as noted.

Auxiliary Transport Service

The need of auxiliary transport service in connection with a regularly established air transport service for passengers, mails or goods, has been already noted.

The needs here will vary with local conditions and with the character of the service. In one important respect this requirement differs from those relating to navigational aids and landing fields. With the latter a single set of landing fields and aids to navigation will, in general, answer for all services over a given route. On the other hand, auxiliary transport service, where it does not already exist, must, as a rule, be individual to the particular service in question.

In some cases, due to the convenient access of existing services (street cars, motor bus, etc.), no auxiliary service will be required; but in general the possible need for such service must not be overlooked, especially in connection with the economic examination of any project of commercial air transport.

A Lesson in Salesmanship

A BUTCHER in an eastern industrial city recently tried an experiment to prove an assertion he had made in an argument that working folk were "spending fools." He made up a quantity of Hamburger steak and put it in two lots, one priced at 28 cents and the other at 42 cents a pound. He told his clerks not to recommend one above the other but wherever possible to let the price cards do all of the work. Above all, the clerks were not to lie. The result was that the 42 cent lot was sold while one-third of the 28 cent lot was moved. It seems that there is room for education!

THE farmer, as a buyer, is the subject of a good many recent market publications and all of these conclude that he should remain a liberal buyer, especially of equipment, for a number of years. A recent Babson report estimates that within the next year the farmer will invest $6,000,000,000 for tractors and $4,000,000,000 for minor cultivation articles. These figures loom very large and they should prove very attractive to the manufacturer.

Centrifugal Machines Recover and Purify Oil

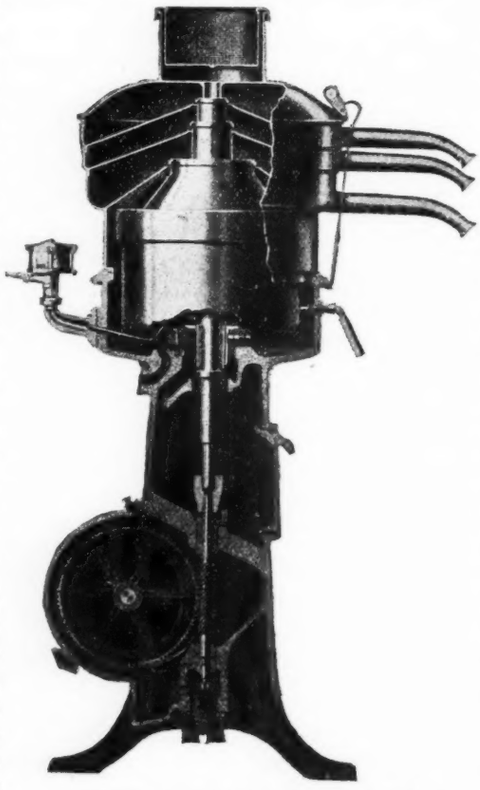
Much waste lubricant and fuel oil may be reclaimed by the utilization of apparatus recently developed. A simple mechanical means of removing foreign elements is so used that a machine requiring little attention has been the result.

IN recent years there has been an enormous increase in the use of mineral oils in the industry. Oil is now used not only as a lubricant, but also as a coolant. In many industries where oil is used there has been much waste, because the oil becomes quickly contaminated with dirt, water or light mineral oils, such as gasoline or kerosene, which render it unfit for the purpose for which it is intended. A good example is the waste in the use of lubricating oil in the tractor business. Most manufacturers of kerosene-burning tractors recommend that the crankcase oil be renewed every day. Since it has been considered impractical to separate the fuel elements from the lubricating oil, the diluted oil is generally thrown away. There has been equally great waste in the use of cutting and hardening oils.

A series of machines for recovering lubricating, cutting and hardening oils and for purifying fuel oils has been developed by the De Laval Separator Co. These machines are based on the principle of centrifugal force. It is well known that when a mixture consisting of mineral oil, water and solid impurities is allowed to stand in a test tube for a considerable length of time the constituents of the mixture will separate out, those of the greatest density (the solid matter) settling at the bottom and the lightest constituents (the oily components) collecting at the top. Exactly the same effect is produced if the mixture is subjected to centrifugal force, only the action takes place in a much shorter time, as the centrifugal force may be hundreds of times as strong as the force of gravity.

Three types of machines are made for treating oil, known respectively as a multiple oil clarifier, an oil purifier and an oil filter. The first of these machines is used for separating solids from the liquid in which they are suspended. It has only one discharge nozzle through which the liquid escapes, the solids being retained in the sediment pocket provided inside a revolving bowl. The oil purifier is used to separate two liquids of different specific gravity, the bowl having two outlets, one for each liquid. A certain amount of sediment also is retained in the bowl. The oil filter is used to remove from the oil extremely fine or light particles which cannot readily be separated from the oil by means of centrifugal force. This machine has only one discharge outlet through which the liquid escapes, while the solids are held in the sediment space in the bowl.

The machines for purifying and filtering oil consist of a cast iron frame with suitable bearings for supporting a vertical shaft which carries the separating bowl at the upper end. The weight of the bowl and spindle, as well as any thrust due to driving, is taken on two tread wheels at the lower end of the vertical shaft. Surmounting the bowl are one or more covers, which receive the discharge of the bowl. In addition to the discharge covers another, known as the overflow cover, is provided. If the bowl should ever become clogged by a large amount of dirt, so that the liquid can no longer flow through it, the inlet tube fills up and overflows into the cover. This keeps the overflow separate and acts as a warning signal that the bowl needs cleaning. At the top is a regulating cover in which the liquid to be treated flows before it passes into the bowl.

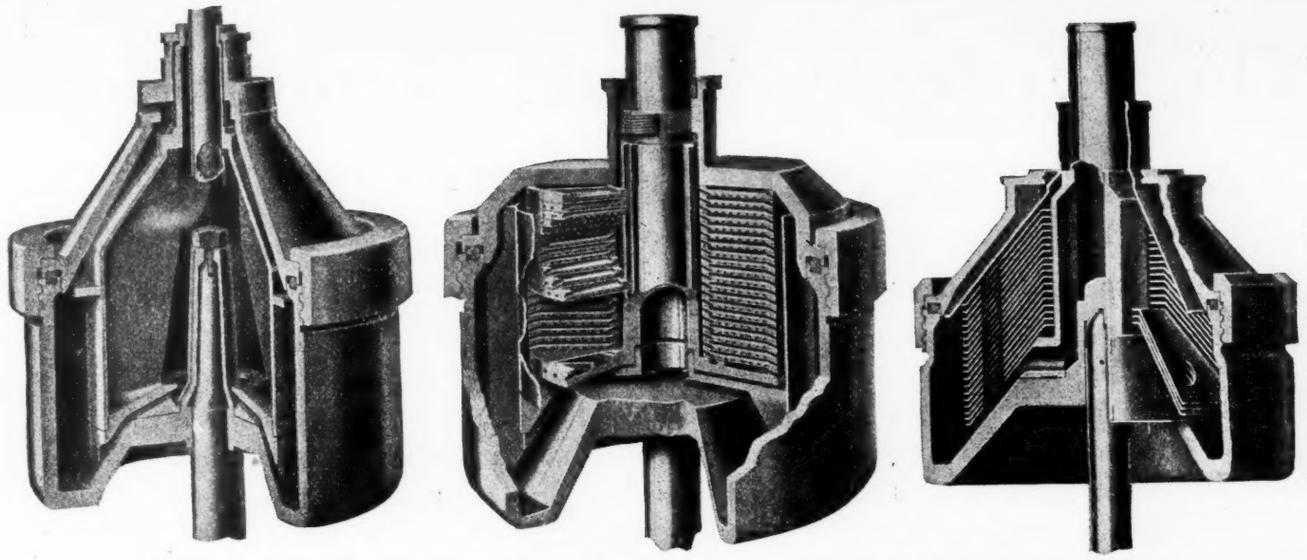


Sectional View of Belt Driven Machine

Two General Types

The machines are made in two general types, the first being belt-driven and the second steam-turbine driven. The smaller belt-driven types are generally furnished with an electric motor mounted directly on the frame and connected to the driving mechanism by a short belt. The power in the belt-driven type is transmitted through a worm-gear and worm to the spindle and bowl, while the turbine-driven machine is equipped with a steam driving-wheel, similar in principle to that utilized in the turbine. An important feature is the speed governor, based on the throttle principle, which insures constant speed of the turbine. Lubrication is automatically taken care of by an oil reservoir at the bottom of the frame and a separate lubricator at the top bearing.

One of the illustrations shows a sectional view of the clarifier bowl. The oil is fed into the top of the bowl and first enters the inner



Sectional views of the multiple oil clarifier bowl, the centrifugal filter bowl and the oil purifier bowl

chamber, where the heavier and more easily separated solids are thrown out and held in the sediment pockets. The semi-clarified oil then passes into the second, or outer, chamber, where, by reason of the greater diameter, the higher centrifugal force clarifies it of the finer particles. The clarified oil is then forced upward to the discharge outlet. One advantage claimed for the double-chamber construction is that the impurities easiest to remove are taken out in a separate chamber and do not interfere with the separation of the finer impurities that are more difficult to remove. Another advantage is the large sediment holding capacity of the two chambers, permitting long runs before cleaning becomes necessary.

A sectional view also is shown of the purifier bowl. In this there are a considerable number of conical steel disks, which are stamped with light projections holding them a small distance apart, as well as with round openings through which the oil can pass. The oil is fed into the top of the bowl and passes down the center to the bottom, whence it flows out and up through the holes in the disks, and is distributed in thin layers. It is here that the centrifugal action on the oil causes separation. Any material heavier than water, such as sand and metallic particles, is thrown outward to the periphery of the bowl and held there in a sediment pocket by centrifugal action. The water, being heavier than the oil, also passes outward and upward along the outer edge of the disks and then to the discharge outlet.

Easy to Clean

The oil, the lightest component of the whole mass, passes inward between the disks, where the thin layers are subject to great centrifugal force, which throws out all remaining traces of impurities and water. These impurities are forced along the lower surface of each disk toward the sediment pocket. The pure oil is forced toward the center of the shaft and then upward to the oil discharge outlet. The bowl will adjust itself automatically to varying proportions of oil and water. If there is no water in the mixture, there will be no discharge from the water discharge outlet.

In the filter bowl, as shown, there are two compartments, the inner one being built with corrugated plates. Between the plates is placed filter paper or some other suitable filtering medium. The oil to be filtered enters at the top of the bowl, flowing to the bottom, and is forced out to the outer or clarifying chamber, where the heavier particles are thrown against the outer wall. The partly clarified oil passes through the inner chamber, entering the openings in the several plates, percolating under slight vertical pressure to the filter papers and then passing inward and upward to the discharge outlet.

An important advantage of this construction is that the filter is self-cleaning, because the centrifugal force throws all impurities out to the dirt holding space. This insures long running before it is necessary to renew the filtering material. Ease of cleaning is one of the advantages claimed for this filter bowl, as the filtering plates are removed in one unit and require dissembling only when it is necessary to put in new filter papers.

Monoplane Flying Boat

ENGLISH papers carry some descriptive notes on the Dornier giant monoplane flying boat, which was built by the Zeppelin Works at Lindau, on Lake Constance, and was under construction when the armistice was signed. The machine may also be described as a single float seaplane. Its wing span is 108 ft. and its power plant consists of four Maybach engines of 260 h.p. each, driving two tractor and two pusher propellers.

The fuselage is placed over the wings, and in it are housed gunners and others of the crew. The pilots are seated down in the boat or central float, which also accommodates the gunners. Between the pilot and the rear gunner in the boat are located the fuel tanks, which have sufficient capacity for a 10 hr. flight. The machine carries a crew of nine. With full load it has attained a speed of about 90 m.p.h.

One of the most creditable flights made with this machine was from Lake Constance to Norderney, the Naval Air Station in the North Sea, that is, clear across Germany from south to north, without intermediate landing.

THE Postoffice Department of the United States has already made an excellent start in the way of developing the experience necessary to plan definitely for a very considerable extension in air transport as applied to the mail service. For more than a year mail service has been maintained between New York and Washington and with a high degree of reliability and efficiency.

The Federal Trade Commission and Its Functions

This is a perfectly human and understandable story of the Federal Trade Commission. Very few men know accurately the reason and the result of this creation. It came into being during the exciting period of the World War and has never had a good chance to explain itself clearly. In this address delivered before business men at Atlantic City, Member Colver talks as man to man and he finds more to praise in business than to condemn

I DO not like to think of the Federal Trade Commission as an agency of government devoted to business nor to any other subdivision of the public. In the President's Cabinet the public interest is subdivided and each is specially represented. But Congress clearly intended the Federal Trade Commission to function, solely, in the interest of all the public. If it shall do this faithfully, fearlessly and well, it will do far more for American business, whose welfare is the general welfare, than if it shall assume to be the special pleader for or the champion of business.

The public interest! The general welfare! The common good!

These are the very cornerstones of our government. Next come the guarantees of individual life and liberty and the pursuit of happiness and the protection of the ownership of private property.

But individual liberty is only to be enjoyed up to the point where it encroaches upon the liberty of another. The individual may forfeit not only his liberty but his life to society. Property rights yield, also, through taxation or the exercise of eminent domain when the higher right—the general welfare—is involved.

For years we have seen the growth of organized subdivisions of the public. Such organization is proper and to be encouraged—but only to the point where an invasion of the general welfare, the public interest, is threatened.

Capital has been encouraged to organize into corporations so that larger business units might be created. But when these giants began to combine into trusts the public interest was threatened, and a contest between public and private interest has been waged for over forty years. There is no objection to size—as such—but no part of the nation may be permitted to be more powerful than the whole.

Labor was encouraged to organize by trades and crafts, and these have united in the common interest of the wage-earner. As in the case of organized capital, there can be no objection to the mere size of such combinations; none, unless the general welfare, the public interest, is threatened.

We have just fought the greatest war in history to the end that the world may be safe for democracy. That is, that a rule of right and of reason may be substituted, internationally, for the rule of might and of force.

Shall not the same end be served in our domestic affairs? Shall great business concerns be permitted, in order to find investment for unwieldy surpluses, to ruthlessly invade other and unrelated lines of business, and to trample the peaceful traders in the market place like a herd of mammoths?

Shall a public service corporation—as in Toledo—be allowed to call its rolling stock out on a general strike without regard to the public interest or the general welfare and comfort of the owners of the streets of that city?

Shall the organized wage-earners, who constitute so great and so important a part of the public, for a moment disregard the greater welfare of the public of which it is a part?

During the war, each was ready to contribute his property, his services, his very life, to the common cause—the general welfare, the public interest. Imbued by such a spirit America was invincible. Shall we go back to a struggle—a civil war—between great business enterprises and smaller ones? To a primitive warfare between employer and employee? To a guerrilla warfare between producer and consumer? To a division into armed camps as to farmers and city dwellers? It is unthinkable.

We have shown the world what an army of the Soldiers of Freedom, backed by the labor and capital, the arts and industries and the genius and resources of a free land, united, can do. Shall the armies, the divisions, the brigades, the units and the individuals of America United now turn against each other? It cannot be! The public interest is paramount. The public interest is supreme. The ills and hardships of any subdivision or class can safely be trusted to be solved in the public interest. The court of public opinion can not be orderly and sane in its judgments if it is a Bedlam filled with the cries of contending parties. Let us have peace in the Court of Public Opinion. Let each submit himself

to the judgments of that high court—for if we do not, and if the Public Interest is subordinated to any or several special interests, then the Law of the Jungle will be the law of the land, and Liberty and Justice will be fugitives hunted by organized bands of madmen.

Organized Capital; organized Labor; organized Farmers; organized Landlords; organized Tenants; and organized Everything and Everybody can and will be useful in our national life so long as they function solely in and for the Public Interest.

Organized Selfishness? Never.

When Congress, in September, 1914, passed the law which created the Federal Trade Commission, it declared a simple principle of law which sums up in the fewest possible words, the ideals of American business and its relation to the great public. Congress said: "Unfair methods of competition in commerce are hereby declared unlawful."

After making that declaration the Congress set out in careful detail a careful and orderly procedure for the Commission to follow in the enforcement of the principle of law. The Commission has followed this procedure and has found the American business man in 999 cases out of a thousand to be its ready ally.

The procedure is as simple as it is thorough, and the end and the purpose is to serve the public interest by helping business to free itself from unfair practices to the end that healthy business rivalry may be carried on keenly, fairly, honestly, and in a business-like and a sportsman-like spirit. There is no unwinding of red-tape in setting the processes of the Commission in motion. A business concern, if it feels that it is being harassed or oppressed, unfairly, by a business rival, may apply to the Federal Trade Commission stating the facts as it sees them. There is no expense attached either to the filing of an application for complaint nor to the subsequent proceedings. The application is usually a business letter citing in plain language the writer's facts and opinion on the subject.

Thereafter, the Commission, through its staff of investigators, makes a preliminary investigation to find out (1) whether the practices complained of are actually being indulged in; (2) whether or not if they are indulged in, it would seem that they may be unfair; and lastly, and most important, whether or not it is in the public interest that a further proceeding should be had by the Commission.

It has been found that in a great many cases, the application for complaint is not well founded. The proportion of ill-founded applications for complaint was much greater in the earlier years of the Commission's existence than now, when the scope and purposes of the law have come to be better understood by the business world. At first, many applications for complaint really involved nothing more than private business quarrels, in which there was little or no invasion of the public interest. If the application for complaint does not, on preliminary or ex parte examination, appear to be well founded, it is dismissed. But it is dismissed without prejudice, and may be renewed if the applicant so desires.

If the preliminary investigation seems to indicate that, in the public interest, a further and more formal examination should be made, the Commission is bound by the law creating it to issue its formal complaint. This is in writing, and is served upon the business concern complained against—the respondent. Respondent then has forty days in which to file his written answer. Thereafter, and without any expense to the complainant, testimony is taken. The respondent is present at all hearings either in person or by counsel or both. He has opportunity to cross-examine all witnesses and has a reasonable time in which to prepare and present his defense. For this purpose there is placed at his disposal all the processes of the Commission to require the attendance of witnesses and the production of documentary evidence so that every facility is given for a complete and full presentation of his side of the case.

After the testimony on both sides is in, briefs may be filed and oral arguments heard, if desired by the respondent, and in the end, the Commission may either dismiss the complaint or issue its order to cease and desist from the practices complained of.

If the Commission's order to cease and desist seems to the respondent to be a hardship, he has the right of appeal to the Circuit Court of Appeals of the United States (which may set aside or modify the Commission's order) and the further right of appeal to the Supreme Court of the United States.

During the four and a half years since the organization of the Commission for business, and up to Nov. 1, 1919, there have been 1,482 applications for complaint before it.. Of these, after ex parte examination, 756 were dismissed without public notice or knowledge, and oft-times without the concern complained against even being bothered by knowing that it has been complained against; 385 such applications are now in the process of preliminary examination.

With respect to the remaining 341 applications, the Commission has instituted formal proceedings resulting in the issuance of 460 formal complaints, the excess being due to the fact that in some applications there were a number of respondents who were proceeded against individually.

Of the 460 adversary proceedings, 212 have been disposed of and 248 are pending. Of the 212 disposed of, 26 were dismissed, the respondent having made sufficient showing of defense.

In the remaining 186 cases, the Commission's order to cease and desist were issued and here comes a most noteworthy fact—**for in 156 of these 186 cases, the order to cease and desist were issued by and with the consent of the respondent.** On that showing I pay tribute to the inherent fairness of the American business man. Time after time when a business concern is shown by the testimony of witnesses a course of conduct which it was following, and which, viewed only from its own standpoint seemed to be simply "good business," was, unfairly, **working a hardship upon a competitor, and was contrary to the public interest, then it has voluntarily and cheerfully agreed to abandon the practice and accept the order to cease and desist.**

In the remaining 31 cases, the respondent resisted the order and the action went on through trial and argument, resulting in the Commission's order to cease and desist.

Out of the whole number of cases where the Commis-

sion has issued its order, in only seven has the respondent been moved to avail himself of his right to appeal to the Circuit Court. Thus far, two of these cases have been passed upon by the Circuit Court. In one of them, the Commission's order was affirmed, and in the other it was reversed. In the latter case, a writ of certiorari has been granted by the Supreme Court of the United States on motion of the Commission.

Trade Practice Submittal

Not infrequently an application for complaint is directed at some old and established business custom or at some less ancient practice, but one which has become almost universal in the trade or industry. Sometimes for some reason or other, a very large number of complaints reach the Commission from a single trade or industry within a comparatively short time, indicating that some new impulse is at work. **Not infrequently this impulse grows out of the fact that a trade abuse or practice has gone on growing more and more burdensome to the industry until it becomes intolerable, and the industry revolts.**

In such cases a vast majority of those engaged in the business desire to abandon the practice or practices, but individuals hesitate to attempt to turn over a new leaf unless he knows his competitors will do the same.

In such a situation the Commission conceives that the matter in hand is of such importance to the industry that a far-reaching order by it could not best be based upon the hearing of one or a few individual cases, no one of which, nor all together, might present all the factors to be considered, nor fairly indicate the consequences of the issuance of an order or the refusal to issue an order. Now, the Commission does not turn to the musty volumes of the law library, but instead it turns for the facts to the industry itself and to all parties touched by it, seeking as a light for its footsteps, the practical knowledge and judgment accumulated by the parties to the industry.

Practices which are alleged to be unfair and contrary to the public interest are submitted publicly to the representative men affected by those practices, and the industry itself is asked to declare for the guidance of the Commission what it deems to be the law-merchant and to set its mark of disapproval upon unfair practices. Such meetings as these are among the pleasantest and most instructive experiences of the Commission. We have found that business men, asked to declare what is right and fair, check the razor of business rivalry at the door and business rivals sit side by side and discuss frankly and freely, the abuses which have grown up in their trade. **Neither the fact that a given practice is almost universally employed or that by reason of its age it has come to be more or less accepted as an inevitable thing, stands in the way of a frank and decisive condemnation of it by the industry itself.**

Thus, the Commission secures for its guidance the mandate of business as to what is and what is not unfair, and thereafter, if the practice is persisted in and application for complaint is made, the Commission proceeds with the certain knowledge that it has the backing and the sympathy and understanding of the vast majority of the men in that industry.

I have had the honor on a number of occasions to appear before such representative groups of business men as this, and at such times I am impelled to raise my voice against the excess profits tax. I believe it would be a good thing if the excess profits tax law could be repealed today. Experience seems to have demonstrated that the excess profits tax is one of the foundation stones upon which the present intolerable price structure has been reared, and which works such hardships both upon the consuming public, and so, of course, upon the business public.

In the beginning, the excess profits tax, as I understand it, was not a revenue device at all. During the war, when it became necessary to fix prices, it was found that there was a wide range in the cost of production of the same commodity between the high-cost operations and the low-cost operations. So long as the theory of fixing a single price was adhered to, it was necessary to fix that price high enough to bring into production the needed output of the high-cost operation. The excess profits tax was proposed as a means whereby undue profits which might accrue to low-cost operations could be covered back into the Treasury to provide in part the money with which the Government could pay the high fixed price.

In other words, the theory was that by taking back 30 or 50 or 60 or 80 cents out of a dollar of undue profits a condition of private profiteering would be avoided. I do not think it has worked out that way. It seems to me that it has been an attempt to lift one's self by his boot straps and losing 70 or 60 or 40 or 20 per cent of the energy so employed. The inevitable result has been in aid of the creation of a price structure intolerable both to the producer and the consumer.

I had an interesting letter the other day from a business man out in Illinois, who said that the excess profits tax, insofar as it is a revenue producer, penalizes the relatively small concerns in comparison with large concerns, which often have a more or less inflated capital. Let me quote a sentence or two from his letter. He says:

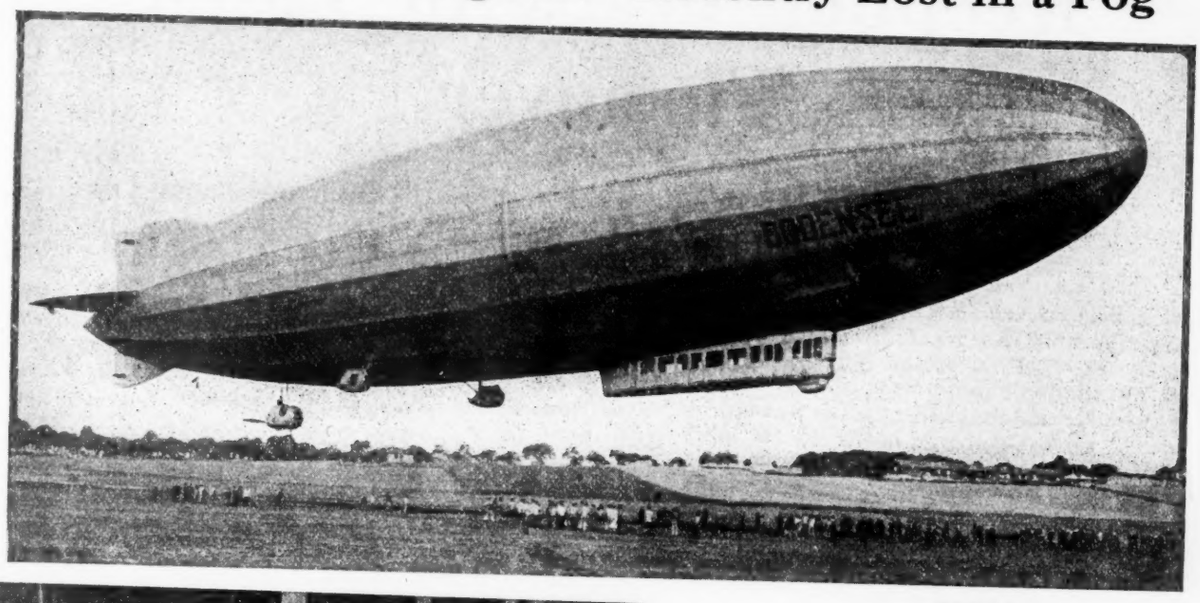
> **There are thousands of corporations in this country of small or moderate capitalization, whose stocks are not on the market and whose capitalization has been kept extremely conservative. Enterprise, initiative, mechanical ingenuity, ambition and hard work are penalized so that if a small firm does a large business on a small capitalization, the tax practically cleans it out. Whereas, a concern with a somewhat inflated capitalization going along at an easy gait, making a moderate return on the claimed capitalization, gets off with a very much smaller tax rate and enjoys a very much larger rate of divisible profit.**

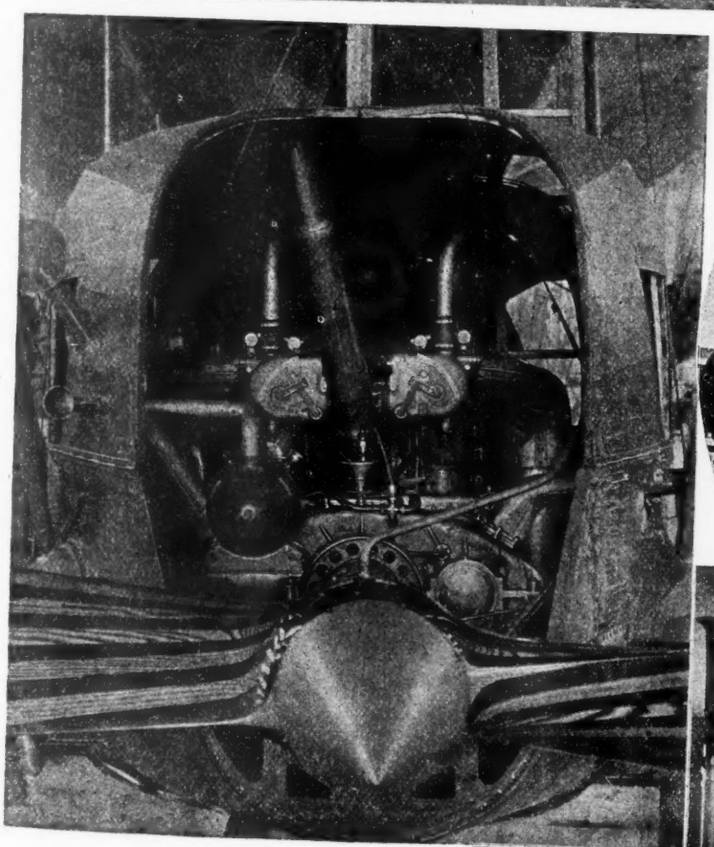
This gentleman went on to argue the loss to stockholders, when saying:

> **The tendency is to pay large salaries and to increase expense otherwise. The result is that stockholders who are not active in the business and receive no salary are not only taxed more heavily than the owners of other kinds of property, but their property is decreased in value.**

But since, as a matter of fact, the excess profits tax was created as an equalizer in cases of price fixation, and since prices are no longer fixed, even that reason for its continuance is removed. I think the tail should follow the hide.

The German Dirigible. Recently Lost in a Fog





This is the Bodensee, the German dirigible that recently was lost in a fog and came near being wrecked. These pictures were made when the dirigible was again ready for the air. The engine is a Maybach, which has been described in AUTOMOTIVE INDUSTRIES.

Keeping Track of Labor Turnover

Forms Used by a Large Manufacturer to Record Emloyment and Loss of Labor

In his article, "Keeping Track of Labor Turnover," which appeared in a recent issue of Automotive Industries, E. H. Fish, of the Norton Co., Worcester, said that "no single figure, no matter what the definition of labor turnover may be, will give the general manager a true idea of what is going on in the shop or office." An analysis of the reasons for leaving, classified according to departments, is the important thing.

It is important, too, not only to classify the reasons for leaving but also to classify the reasons for discharges. By so doing an indication is obtained of the efficiency of the foremen as handlers of the men under them.

Mr. Fish stated also that the division by departments should be fine enough to reach the foreman whose influence is most felt by the workmen.

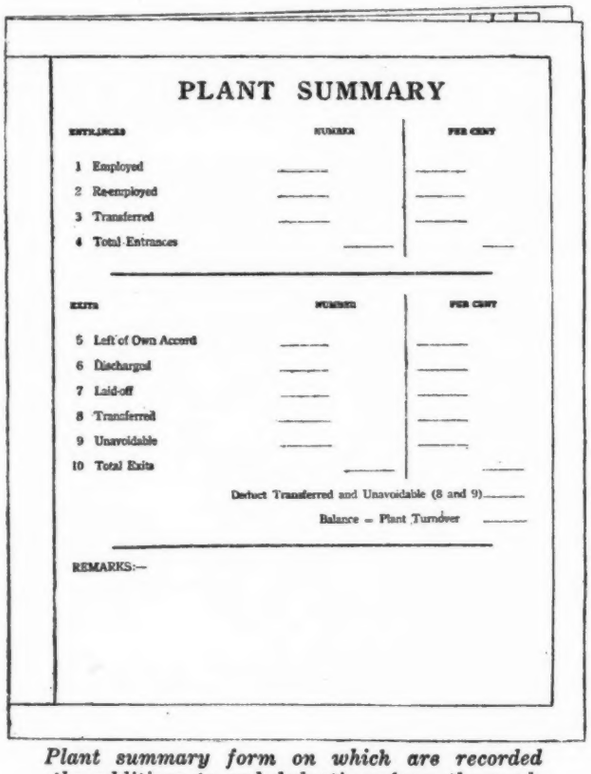
On this and the following page we reproduce some of the forms which are used by the Norton Co. in its employment department. The large form, which is made up as a folder opening to a size of 10¼ in. high by 16 in. wide, carries on its first page a plant summary showing the number of additions to and deductions from the plant personnel for the period considered. Both the entrances and exits are subdivided and the totals for the two classes are applied against each other and the net against the last previous shop total.

The analyzed record of turnover, which extends over both of the inside pages of the folder, is arranged to give in detail the number of entrances and exits and the net change for each department during the period.

New employees and those re-employed are classified according as they are experienced, learners or laborers. Transferred employees, who are, of course, considered as exits from the departments from which they are transferred, and as entrances to the departments to which they are transferred, are classified according to the reasons for their transfer.

superannuated employees, women operatives who marry, and deaths. "Own Accord," under Exit, is further sub-

The exits are divided into main headings as follows: Left of Own Accord, Discharged, Laid Off, Transferred, and Unavoidable, the latter including pensioned or



PLANT SUMMARY

ENTRANCES	NUMBER	PER CENT
1 Employed		
2 Reemployed		
3 Transferred		
4 Total Entrances		

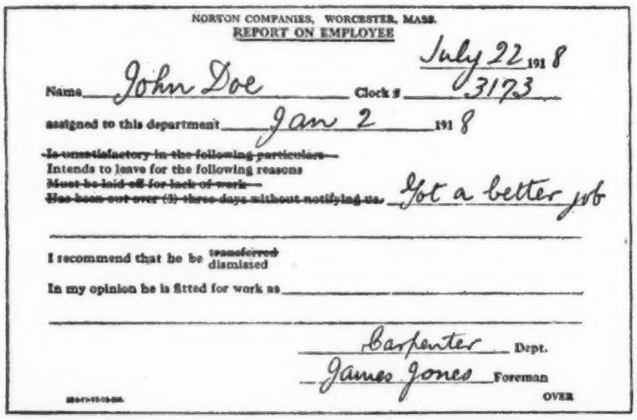
EXITS	NUMBER	PER CENT
5 Left of Own Accord		
6 Discharged		
7 Laid-off		
8 Transferred		
9 Unavoidable		
10 Total Exits		

Deduct Transferred and Unavoidable (8 and 9)

Balance = Plant Turnover

REMARKS:—

Plant summary form on which are recorded the additions to and deductions from the working force of the Norton Co.



NORTON COMPANIES, WORCESTER, MASS.
REPORT ON EMPLOYEE

July 22 1918

Name John Doe Clock # 3173

assigned to this department Jan 2 1918

~~Is unsatisfactory in the following particulars~~
Intends to leave for the following reasons
~~Must be laid off for lack of work~~
~~Has been out over (3) three days without notifying us~~ Got a better job

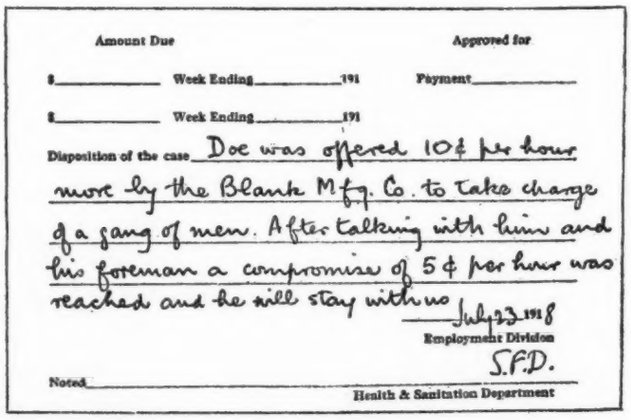
I recommend that he be ~~transferred~~ dismissed

In my opinion he is fitted for work as

Carpenter Dept.

James Jones Foreman

OVER



Amount Due Approved for

$ Week Ending 191 Payment

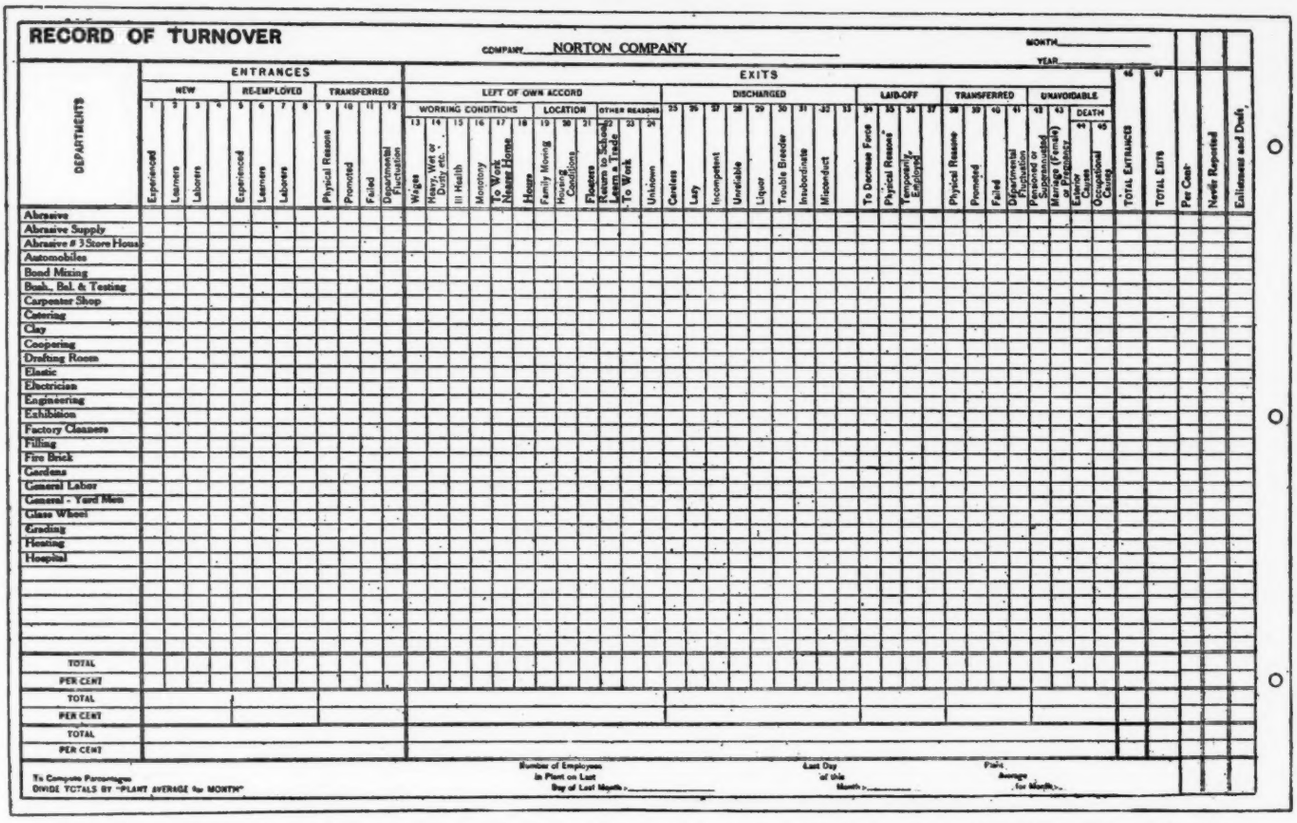
$ Week Ending 191

Disposition of the case Doe was offered 10¢ per hour more by the Blank Mfg. Co. to take charge of a gang of men. After talking with him and his foreman a compromise of 5¢ per hour was reached and he will stay with us

July 23 1918
Employment Division
S.F.D.

Noted
Health & Sanitation Department

When an employee evinces a desire to leave, one of these forms is filled out and he is sent to the employment manager. In this case the employee was induced to remain with the company



RECORD OF TURNOVER

COMPANY NORTON COMPANY

MONTH

YEAR

| DEPARTMENTS | ENTRANCES: NEW 1 Experienced | 2 Learners | 3 Laborers | 4 | RE-EMPLOYED 5 Experienced | 6 Learners | 7 Laborers | 8 | TRANSFERRED 9 Physical Reasons | 10 Promoted | 11 Failed | 12 Departmental Fluctuation | EXITS: LEFT OF OWN ACCORD — WORKING CONDITIONS 13 Wages | 14 Heavy, Wet or Dirty etc. | 15 Ill Health | 16 Monotony | 17 To Work Nearer Home | 18 Hours | LOCATION 19 Family Moving | 20 Housing Conditions | 21 Pleasure | OTHER REASONS 22 Return to School, Learn a Trade | 23 To Work | 24 Unknown | DISCHARGED 25 Careless | 26 Lazy | 27 Incompetent | 28 Unreliable | 29 Liquor | 30 Trouble Breeder | 31 Insubordinate | 32 Misconduct | 33 | LAID-OFF 34 To Decrease Force | 35 Physical Reasons | 36 Temporarily Employed | 37 | TRANSFERRED 38 Physical Reasons | 39 Promoted | 40 Failed | 41 Departmental Fluctuation | UNAVOIDABLE 42 Physical Reasons Superannuated | 43 Marriage (Female) or Pregnancy | DEATH 44 Extraneous Causes | 45 Occupational Causes | 46 TOTAL ENTRANCES | 47 TOTAL EXITS | Per Cent | Needle Reported | Enlistment and Death |
|---|---|---

Road Building in Chile Should Mean a Demand for U. S. Cars

Apparently there is only one reason that a greater number of motor cars have not been sold in Chile, and that is roads. But the leaders there, from the President down, are getting active in the promotion of better highways and so there are hopes, even though the most of the country is on the mountains or so near them, that road building is a serious problem. But Europe regarded Chile as a good market and the United States should find it worth considering

THE popularity of American made automobiles in will augment importantly the import of automobiles Chile and the increasing prosperity of the country from the United States as soon as the Chilean highway system is properly constructed and maintained. Chilean exports have increased 500 per cent since 1913, bringing a prosperity that indicates a large automobile consumption in the next few years.

The demand for American automobiles in Chile has increased considerably during the last five years, due not only to the lack of European made cars, but also because the Chilean public has become familiar with the conveniences of automobiling and is particularly attracted by the comparatively low price of certain American cars. At the same time the high-grade American cars have been demonstrated with success to those Chileans who can afford expensive cars and the family coaches and carriages are being rapidly replaced.

The lack of good roads affects the use of automobiles outside of the Chilean cities. The country is mountainous, two chains extending 2,500 miles its length, and road construction is a serious problem. In the central part of the country where the rich agricultural section contains the mass of population which would be able to purchase cars, the heavy rains and numerous streams constantly menace road improvements.

The rapid increase in commercial cars, passenger cars and motorcycles shipped from this country to Chile since 1913 is shown in the table below, giving 3,399 passenger cars exported for 1918 as compared with 78 in 1913.

The war restrictions in this country during 1919 reduced the export of cars to Chile. It will be noted that tire exports increased in 1919, although all other commodities decreased. This is due to the severe wear and tear to which tires are subjected on the Chilean roads. Prior to the war the American export of automobiles to Chile represented but 8 per cent of the total, while Germany had 22 per cent of the trade, France 23 per cent, Great Britain 13 per cent, Italy 9 per cent, Belgium 4 per cent, and about 16 per cent came through Argentina. The following table shows you the war change of Chilean imports, with the United States by far the greatest shipper:

Country of Origin 1913	Commercial Cars Pesos	Passenger Cars Pesos	Parts Pesos	Tires Pesos	Total Value Pesos
France	.....	325,086	3,722	56,537	385,346
Germany	29,499	315,650	5,431	71,875	422,455
United Kingdom	.....	184,149	6,271	59,932	250,352
United States	.....	121,015	7,527	148,416	276,958
Argentina	.....	231,806	269	3,172	235,247
Italy	.....	127,911	596	1,220	129,727
Belgium	4,288	57,948	96	664	62,996
All other countries	.....	1,305	.....	2,304	3,709
Total	33,787	1,364,970	23,912	344,121	1,766,790
1917					
United States	372,110	8,898,306	1,000,821	777,861	11,049,098
Argentina	15,543	39,127	88,413	26,432	169,515
United Kingdom	4,072	77,225	16,993	59,699	157,989
France	.....	.....	51,621	92,891	144,512
All other countries	3,584	.....	5,076	8,950	17,610
Total	393,309	9,014,658	1,162,924	965,833	11,538,724

About 80 per cent of the automobiles imported into Chile go through Valparaiso, from which point they are distributed to the central agricultural section of the country, the largest share going to Santiago, the capital. Other ports receiving motor vehicles include Talcahuano, Antofagasta, Iquique and Punta Arenas.

A recent consular estimate places the number of automobiles in Valparaiso City at 4,000, which includes many European models purchased before the war. No other census of automobiles in Chile is available, but United States export records show that 8,262 passenger cars and 460 trucks have been shipped to Chile from this country in the last seven years.

Without question the chief obstacle to increased automobile business is the Chilean highway system, which Chile now recognizes as an important consideration and is attempting to improve. The use of prison labor for road repairs and the purchase and operation of road machinery by the Army are being suggested. Chilean statistics state that 21,002 miles of road are available, but this includes trails and mule paths.

The President of Chile in his message to Congress last June strongly urged reform measures in the construction

Parts, Value	Tires, Value	Motorcycles No.	Motorcycles Value	Total Value
$ 4,711	$ 2,844	39	$ 8,134	$ 125,671
22,405	10,636	37	7,967	211,945
14,721	21,353	2	570	100,971
72,939	58,809	14	2,406	710,931
248,043	264,603	34	6,389	2,501,573
806,015	725,876	88	18,041	5,409,081
775,556	1,130,873	56	13,825	3,750,745

Year	Commercial Cars No.	Commercial Cars Value	Passenger Cars No.	Passenger Cars Value
1913	...	.....	78	$ 109,982
1914	2	$ 10,743	195	160,194
1915	...	.....	120	64,327
1916	17	46,566	826	530,211
1917	69	160,696	2,587	1,821,842
1918	220	282,638	3,399	3,576,511
1919	152	223,733	1,057	1,606,758

and upkeep of roads, and the Chilean Congress is considering a new road law which would provide adequate funds to connect the capitals of provinces and the larger towns and mining centers with ports, railway stations and navigable rivers. The bill would appropriate $4,000,000.

Iquique, the chief port for nitrate shipment, offers an especially good motor truck market. It is a city with a population of 40,000, and except for the nitrate railway has no transportation other than that of carts and mule teams. Experiments are being made on the sand roads which lie behind the city in motor truck transport, and if these prove successful they will undoubtedly replace the teams and carts. Plans are also under way at present for construction of an automobile road extending 6 miles south from Iquique and for paving the city's streets.

Antofagasta, the second nitrate outlet, is the largest port in northern Chile, the chief shipping point of the copper companies, and is a city with a population of 50,000, a prosperous and already an excellent automobile market. Even the taxicabs are of the large, expensive types. The city streets have been paved with tar, asphalt composition or block stone, and there is a good road running out from the city about 5 miles long. An autobus line is in operation, the city has installed automobile garbage trucks, and the mining companies in the vicinity are all planning to use trucks for transport of supplies to the camps. The construction of a road 8 miles in length and 30 ft. in width is planned south of Antofagasta, this road to be built on the co-operative basis by the government and the interested property owners.

The Valparaiso Market

Valparaiso, with a population of 200,000, is improving its highways both in and out of the city, and assures a valuable market for motor vehicles. It is contemplating the installation of motor buses. An automobile association has been formed and is directing its first attention to highway construction, particularly between nearby resort cities in which many of the wealthy Valparaisons maintain their homes. A road is being contemplated between Valparaiso and Vina del Mar, one of the suburbs, which will be connected with the metropolis by a highway to cost 2,500,000 pesos. After the road is built a toll will be levied for not more than ten years, ranging from 2 cents for a motorcycle to 20 cents for a truck. The highway will be 98 ft. wide.

Automobiles are also trying to raise funds for a new shorter route from Valparaiso to Santiago. The country around Santiago is level and roads can be built with less difficulty than in the mountainous regions. Santiago city streets are all paved and include a number of wide avenues. About a fourth of the cars used in Santiago are taxis, which compete with the street cars. There is some interest in the possible introduction of motor omnibuses.

The Chilean Government has also made recent appropriations for the upkeep of the highways in central Chile, where its rich agricultural population exists and where American automobile manufacturers may find their best markets.

In Punta Arenas there is a good demand for both passenger and commercial cars. This city already has 1,400 vehicles, and every large ranchman is a prospective buyer for a truck that will haul his wool from his ranches to the coast, a distance of 300 miles. Most of the hauling has been done by oxcarts, and the feeding and watering of the oxen is a difficult problem. It is estimated that they can save 40 per cent by the use of motor trucks. The Punta Arenas roads are serviceable for seven months in the year, from October to April. During the rest of the year the rains and snow make the roads impassable.

Cars for Punta Arenas should be shipped direct to take advantage of free admission to that port, and also because freight rates from Valparaiso and Buenos Aires are very high. Knockdown boxing affects large freight savings.

The most popular passenger cars in Chile are limousines and landaulets, with decorative finish and luxurious upholstery. Black and dark blue cars should never be shipped except on special order. Smaller cars are not commonly used, and the few to be seen usually have a seat for the liveried chauffeur, who is required by custom. "Smart" cars of various sizes are liked. The underslung types of machines are not practical over rough Chilean roads; cars should have a clearance above 10 in. and a tread of at least 60 in. Two-ton trucks are popular for farm freight, while lighter trucks are used for town or city delivery. In the southern territory trucks should be adapted for hauling logs and wool, while in the central grain and other farm products must be transported, and in the northern districts ore and supplies for mining camps form the cargoes.

There seems to be a prejudice against electric automobiles in Chile, but a market might be developed for them by active campaigning or demonstration. Santiago, with level, well paved streets, appears to be a good electric car field. The temperature in that city is moderate and does not fall below 26 deg. Fahr. Facilities for charging batteries could easily be arranged, and as gasoline cars are little used in the country because of the highways, it is possible that electrics could compete successfully for city use. The two points which have appealed to buyers of electrics in the United States, viz., cleanliness and ease of operation, do not have the same weight in Chile, for driving by women is unknown.

The type or finish of automobiles plays no part in the tariff rates in Chile, where weight alone is considered in the fixing of duties. This makes the tariff highest on the larger machines, excepting motor trucks, which are dutiable at only a third of the rate on passenger cars. The Chilean customs duty on motor trucks is $3.31 per 100 lb. gross weight, on passenger cars $9.93 per 100 lb. gross weight, and on motorcycles $24.83 per 100 lb. net weight.

The Tourist In Chile

A tourist bringing an automobile to Chile must make application at the custom house in the port of entry, binding himself to pay the usual duties in case he does not re-export the car within six months. All automobiles must be registered and licenses secured from municipal authorities. A license from any municipality is sufficient for travel in any part of the country unless a prolonged stay is made in a different municipality. Licenses from the country of origin are not recognized in Chile.

The best motor season is from September to March, but on account of the scarcity of good roads there is comparatively little tourist travel. Gasoline can be obtained in all the larger towns, recent prices having been 50 cents to 60 cents a gallon in the port cities and higher in the interior. Tires, lubricants and other supplies can only be obtained in the large cities. There are no road rules nor speed limits outside of the cities, but the speed limit in the cities is 15.5 m.p.h. The traffic rules of the various cities lack uniformity. Valparaiso regulations require an automobile to pass on the right of the coming car, for example, while in Santiago it must pass to the left.

Demonstration of cars has been found to be the best method of advertising, although newspapers and circulars are important aids. The American branch banks at Santiago and Valparaiso are rendering important service in furnishing correct information as well as in offering facilities for handling the financial end of shipments.

Managing Industrial Relations A Job That Must Find Itself

This is a new phase of a new topic. What do you understand by Industrial Relations, the department that is being organized in many factories? Mr. Tipper learns from the records of the recent meeting of the heads of these departments that they are not fully agreed upon the limitations of their work. And so, with his usual clearness, Mr. Tipper points out a scope for this work

By Harry Tipper

THE first step in the consideration of the human side in industrial affairs is the abandonment of the old "hire and fire system," and the attempt to investigate the fitness of an applicant, his record and his past experiences, so that a better use could be made of his potential capacity.

To do this, it was necessary to concentrate the employment in one bureau and employment managers came into existence. During the last few years this development has been sufficiently widespread to lead to special courses in some schools for the development of employment managers, so that they would have some special fitness for their work.

Naturally, this examination of applicants, in the attempt to reduce turnover and stabilize the labor conditions, led to the consideration of training, and educational facilities have been installed in a great many plants for the purpose of training employees to greater proficiency in certain general departments of the companies' activities.

The unrest which has been accumulating for the past few years, and which culminated in the severe troubles experienced since the armistice, has lead to the employment of men charged with supervision of industrial relations as a general matter and a sufficient number of these men have been employed to warrant the forming of a national association with its conventions and usual meetings. It is a little difficult to define the duties and responsibilities of the industrial relations managers, and in many cases where they have been employed, the reasons for their employment are very indefinite.

In at least a number of cases where we have talked with industrial relations managers, they have conceived their duty as one of keeping the employees happy with the least possible expense to the company or change in organization policy. In fact, some cases have shown that the industrial relations department in these particular organizations has been created so carelessly that the head of that department has conceived his principal job as a sort of Pinkerton Detective Agency for the management in the factory.

The wisdom of employing special men for the operation of the details of industrial relations work is questionable anyway, and if the employment of such a man is supposed to relieve the rest of the executives from thinking about and studying requirements from the human side, the specializing of such work is dangerous.

The only hope of better conditions in the industrial organization is the education of the executives and supervisors by a continuous exhibition of human sympathy on the part of the management, and a continuous insistance upon human understanding on the part of the subordinate executive.

This education cannot be secured if the industrial relations question is conveniently shelled into a special department, and the manager of that department becomes more concerned with the maintenance of his own job than with the solution of the problem. There are very few industrial organizations so wisely constituted and so sympathetically managed that an industrial relations manager could hope to do his work properly without, from time to time, conflicting with the ideas of those who have hired him.

Unless the industrial relations manager is big enough and possessed of sufficient human understanding to sell his employers out of their own prejudices and habits of mind; to accomplish things in spite of the narrow-mindedness which exists to some extent in all organizations employing a number of minor executives and to secure the confidence of the workers because of his trustworthiness and his strength, the job will not accomplish any material results, and the big purpose with which the department has been started will fail for that reason.

There is a grave danger that hasty establishment of industrial relations departments by manufacturing establishments will confuse the issue, instead of leading to a greater measure of agreement and understanding. As we have stated in these articles a number of times, the subconscious reasons behind the industrial unrest is the lack of any confidence in industrial management by the workers and the consequent lack of allegiance. Secondly, the lack of incentive to work and thirdly the lack

of any knowledge as to the reasons for that work, the ability to create confidence to implant an incentive and to teach, is not usually secured by special education nor is it to be developed merely by the appointment of a special department.

Where supervisors must be concerned with the details of operations, it is important that they be trained especially in the character and requirements of those operations, but such special education does not improve their capacity to handle men, and that capacity is not likely to be improved when the whole subject of human relation is transferred to a special department and the supervisor is relieved of the responsibility.

It is true, that there is a place in the manufacturing establishment for a department which shall see that the continuous process of education is carried on, which shall see that grievances are adjusted and that all necessary changes affecting the interests of the men are properly promoted and understood, but such a department is badly miscalled when it is named an industrial relations department, and a label of that kind may be thoroughly dangerous, because of its suggestion that responsibility is settled upon it.

Even for the purpose of education, the choice of a manager is a very important and somewhat difficult matter. To find a man who knows how to arrange teaching and knows what should be taught, who understands the people who are to be taught and who at the same time has a large amount of that most uncommon quality common-sense, is not an easy task.

If such a man is found, it is not altogether unlikely that his first job would be to educate the management to the things which they have not discovered in their acquaintance with the establishment.

Until the managers of the manufacturing establishments are convinced of the deficiencies of the present system, of the necessity for its change and the justice of the proposed changes, none of the other work will be of much value.

Until the manufacturers realize that the worker has a right to know what becomes of the dollar secured from the customer, that he has a right to know the significance of his work and to discuss his grievances, there is not much use in establishing any industrial relations department.

Those outside of this department must be convinced that the obligation rests upon the manufacturer to understand his workers, their habits of mind and their necessities, and to take such measures as may be necessary for their orderly co-operation. There is one exception to this case, and that is where the manager of industrial relations himself is versed in and convinced of these matters, and sufficiently wise to see the orderly developments of their operation. If in addition to these qualities, he has the strength to convince the manufacturer of the value and importance of the things that must be done, the industrial relations department may improve the organization very greatly and secure the sympathy of all parties by virtue of its own strength.

In other words, the value of an industrial relations manager is about equal to the capacity of the manager as an individual, to the authority which will be given him and to the practicality of his operations. The really effective organization to be adopted in an industrial establishment in connection with the labor question is that which provides a bureau of employment, facilities for training and facilities for general education under one head.

The reason for co-ordinating these under one head is that the knowledge of the individual's record, capacities and tests is of great importance in his training, and the composite picture secured from handling these matters is a fundamental operation in the general education.

An examination of the proceedings of some of the conventions of men who have been appointed to industrial relations management do not suggest that more than a sprinkling of them understand the importance and definite character of their work, while the method with which a number of them have been chosen for their positions indicates a similar lack of understanding on the part of the manufacturer.

Personally I do not believe in any specialized activity which is labeled industrial relations. That subject is too big and too important to be centered in any special department, it is affected too closely by the action of every supervisor for any responsibility to be removed from him in the matter.

Certain operating developments which grow out of it, such as those already stated, can be centered in one department and should be in charge of a special executive, but this man should not be recognized as a separate company activity and his work should be that of a special assistant to the general executive in charge of the manufacturing establishment, and the general executive's contact with him should be intimate and close, as in the case of his other executive assistants.

It is not only that the industrial relations question is big, so big that it frequently goes outside of industry and has its direct bearing upon political methods, but it must be handled not only with a desire for justice and an understanding of the psychology of labor, but with that patient practicality which alone will keep its progress orderly. As one of my deep-thinking friends said to me the other day, "It is not so difficult to see the conditions of final solution, but it is very difficult to determine exactly how the five per cent progress towards that solution can be made in this generation with the least disorder."

To find a man who knows what is wrong is not unusual, to find one who knows what ought to be done is somewhat more difficult, but does not require a deep search, but to find a man who knows not only what is wrong and what ought to be done, but how it can be approached so that there is no radical change and no chaotic interlude, is a very difficult matter indeed.

Industrial departments devoted to better human understanding in manufacturing establishments have come to stay and, in accordance with the personnel of the establishment, they will add their little mite of progress or their little stumbling block in the way of solution. This article is a plea for a careful consideration of the matter and an understanding that such a department must be an operating department and the operations are those of employment, training and attention. The confidence which must be established, the incentive which must be created and the orderly co-operation that must be secured, are matters which depend upon the personnel of the whole concern. Particularly the attitude of the leaders of the concern.

The problems will not be solved alone nor materially advanced by the actions of the special department which has been erected in a number of cases.

AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

PUBLISHED WEEKLY
Copyright 1919 by The Class Journal Co.

Vol. XLI Thursday, November 13, 1919 No. 20

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
A. B. Swetland, General Manager
U. P. C. Building, 239 West 39th Street, New York City

BUSINESS DEPARTMENT
Harry Tipper, Manager

EDITORIAL
David Beecroft, Directing Editor
Clyde Jennings, Managing Editor
P. M. Heldt
DETROIT OFFICE
J. Edward Schipper
WASHINGTON OFFICE
Allen Sinsheimer

BRANCH OFFICES
Chicago—Mallers Bldg., 59 East Madison St., Phone Randolph 6960
Detroit—95 Fort Street, West, Phone Main 1351
Cleveland—Guardian Bldg., Phone Main 1142
Philadelphia—Widener Bldg., Phone Walnut 5601

Cable Address ..... Autoland, New York
Long Distance Telephone ..... 8760 Bryant, New York
Articles on any subject within the scope of this publication are solicited.

SUBSCRIPTION RATES

United States and Mexico ..... One Year, $3.00
Extra postage west of the Mississippi River on account of Zone Postage Law $0.50
Canada ..... One Year, 50.00
Foreign Countries ..... One Year, 6.00
Foreign Countries ..... One Year, 6.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order or Register your letter. Make Checks payable to Automotive Industries.

Owned by United Publishers Corporation, Address 239 West 39th St., New York; H. M. Swetland, President; Charles G. Phillips, Vice-President; W. H. Taylor, Treasurer; A. C. Pearson, Secretary.
Entered as second-class matter Jan. 2, 1903, at the post-office at New York, New York, under the Act of March 3, 1879.
Member of Associated Business Papers, Inc.
Member of the Audit Bureau of Circulations.
Automotive Industries—The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907, and The Horseless Age (semi-monthly), May, 1918.

Lack of Efficiency of Rotary Engines

AMERICAN truck manufacturers should find much of interest in a careful study of the recent rail-armies of the other belligerent countries also had a certain proportion of that type. But as the war continued and experience accumulated, the rotary engine steadily gave way to the stationary type, especially for use on aircraft that had to cover long distances. The reason was the lower efficiency of the rotary engine in respect to fuel and oil consumption. The uneconomical operation of the rotary engine has been fully established, but we have never seen the reasons therefor discussed in detail.

It may first be pointed out that economy **per se** is not an important consideration in military aircraft, but a reduction in fuel and oil economy in the case of an airplane designed for a certain flying radius is equivalent to an increase in weight. The greater the flying radius desired, the more objectionable any slight decrease in fuel and oil economy becomes.

The wasteful use of lubricating oil in rotary engines is undoubtedly due to the fact that centrifugal force tends to cause the oil to flow in a radial direction over any surfaces to which it is fed, and in order to insure a sufficient film on the surface oil must be fed in excess. The loss of oil with the exhaust is undoubtedy promoted by flow of gas in the same radial direction in which the centrifugal force causes the oil to flow.

What causes the uneconomical use of fuel is not quite so clear. As all rotating engines are air-cooled one might expect a rather high economy because of the higher cylinder wall temperature. This advantage is evidently overshadowed by factors that tend in the opposite direction. One important cause of loss of efficiency is no doubt that the exhaust valve is opened shortly after mid-stroke, whereby a considerable portion of the cylinder diagram is cut off. The main cause of loss, however, is the air resistance encountered by the revolving cylinders. When it is considered that a club of narrower width than the engine and of a length only about twice the engine diameter will absorb all the power the engine will generate, it can readily be realized that air resistance is a serious cause of loss. We have it on good authority that a rotary engine delivering 80 b. hp. really develops 90, the difference being used up in overcoming air resistance.

Developing Truck Fields

AT the beginning of the war nearly all the French airplanes were fitted with rotary engines and the road strike in Great Britain. As had been forecasted and as, no doubt, had been expected, the paralysis of rail communication was followed quickly by a mobilization of motor trucks, largely from the military and under supervision of governmental agencies, that served their part well in taking care of the food needs of the Island Kingdom.

British newspapers and periodicals, in discussing the strike, state that the use of trucks in England for commercial purposes, was advanced in the few days of the strike more than would have been the case in years of ordinary life. In other words, the motor truck suddenly became a factor in the industrial and economic life of the nation. The Britisher—who is, perhaps, slow to break away from old traditions and consequently not given often to quick change—had the motor truck thrust before him in such a favorable light that its advantages can not and will not be forgotten. Increased use can be the only result.

The American maker, however, must consider the situation from a larger viewpoint than that of the immediate greater truck sales that may be anticipated in Great Britain. The incident is one that has a world-wide significance and is one that must be considered in planning for future engineering, development and sales policies.

The United States, through previous years of use, has come to see the motor truck in all of its industrial possibilities. No other nation, however—leaving out the military uses—had so adopted the truck for its business needs.

Great Britain, through the strike, has "seen the light"—if one may judge from the testimony of the

press—and the result will be heavier and more widespread use of trucks in that country. What America and Britain have experienced and learned, will be learned and acknowledged by the other nations of the world, provided the truck makers do their part in pushing the development.

In such a light, the British railroad strike, disastrous as it may have been to that country, is a second phase in the development of gasoline transportation. The first came with the war, but that lesson was faraway—in France, Mesopotamia, and the other theaters of the Great British operations—and was not brought home to the industries of England. The rail strike, however, was a close object lesson, its experiences being under the watchful eyes of the British population.

The truck industry—as well as the entire field of automotive endeavor—will be the gainer. But this profit may only be expected with intelligent planning and careful exploitation of the situation as it now exists.

New Battery Rating Questioned

MANUFACTURERS of farm lighting equipment and battery men are not using the storage battery rating recently adopted by the Society of Automotive Engineers. It will be remembered that the S. A. E. recommended a full discharge rating based on a discharge spread over a period of 72 hr., with a standard test at the rate of 1/24 of the ampere hour capacity of the battery for an initial period of 4 hr., followed by a 16 hr. rest and then by two 8 hr. periods, each followed by a 16 hr. rest, the final discharge period after the last rest lasting 4 hr.

Communications from farm lighting manufacturers indicate that when manufacturers contract for batteries with storage battery companies, they use the old standard 8 hr. rating. They believe this to be the honest rating and one that should still be used in reselling batteries to the trade. As one manufacturer puts it, "The standard recently adopted by the S. A. E. calls for an intermittent rating, which, to obtain the ampere hours claimed for the batteries resold by farm lighting companies, must be made at certain intervals. If the purchaser is a good guesser, it is possible he may have some idea of what he is buying—otherwise, he will not. Also, when purchasing a 160 amp. hr. battery at the S. A. E. rating, he is really getting a battery of 112 to 118 amp. hr., using the old standard 8 hr. rating."

Whether or not the contentions of the farm lighting manufacturers are right, it certainly is apparent on the surface that two battery ratings are confusing and that one or the other ought to be adopted by both the battery men and the farm lighting equipment manufacturers as a universal rating. It is not certain which of the two ratings would be favored by the majority, but it seems as if there is at least a considerable minority in favor of the old 8 hr. rating. One manufacturer is furnishing a 160 amp. hr. battery at the 8 hr. rating. This gives approximately 225 amp. hr. at the S. A. E. rating. The prospective customers are informed as to what they are getting when orders are placed and these facts are incorporated in the literature and advertising matter of this manufacturer. This same farm lighting manufacturer states that he believes the old rating would be very satisfactory to both manufacturer and customer and he sees no reason for using another rating at the present time.

When the Electrical Equipment Division of the S. A. E. Standard Committee made its report, it stated that it was felt that the customary methods of rating batteries by the 8 hr. or other short discharge period ratings did not indicate the capacity of the battery under its normal service conditions. The subject was therefore assigned to the Electrical Equipment Division and a third division was formed with a representative personnel of battery and lighting plant manufacturers. This body held a meeting in Indianapolis and worked out the proposed intermittent standard. It was presented to the Electrical Equipment Division for consideration. The latter, after making slight changes in the proposal and securing consent, offered the following recommendations for adoption as S. A. E. standard:

The standard battery ratings shall be established at a standard temperature of 80 deg. Fahr.

The rated capacity of storage batteries for farm lighting service shall be based on a final voltage of not less than 1.75 volts per cell.

Four Wheeled Drive Tractors

THE four-wheel drive principle has a strong attraction for tractor designers and during the past two years quite a few machines of this type have been built. One of the big problems in tractor design is to gain sufficient ground adherence and, as in a four-wheel driven tractor, all of the weight is available for traction purposes, it has an undisputed advantage from this point of view. But how great is this advantage and at what price must it be bought?

The difficulty of securing sufficient traction exists only when the tractor is pulling a heavy load and is working near the limit of its capacity. Under this condition, however, a very large percentage of the total weight of a two-wheel driven tractor is supported on the rear wheels. The tongue reaction tends to raise the front wheels off the ground and, in so doing, transfers some of the weight that rests on the front wheel when no propulsive effort is being exerted to the rear wheels. In fact it is this transfer of load from the front to the rear wheels that governs the load distribution between front and rear axle in the design. If too little load is placed on the front axle, the tractor is likely to "rear" when exerting an extreme drawbar pull. But if under this condition there remains 10 per cent of the total weight on the front wheels the machine is safe.

Therefore, we may figure that when the tractor is working at full load, 90 per cent of its weight rests on the rear wheels or drivers and is, therefore, available for traction purposes, while only 10 per cent rests on the front wheels. The question then is, does it pay to incur the complications of the front-wheel drive in order to make this remaining 10 per cent available for traction?

Makers Increase Output Despite Numerous Handicaps

Record for 1919 Established as 34 Factories Turn Out 7,445 Jobs—Export Business Grows—Labor Shortage Continues in Detroit

DETROIT, Nov. 8—With an output of 7,445 cars during October, the 34 automobile factories reporting established a record for 1919, April, with a production of 7,089, occupying second place. Despite the steel strike and other handicaps which it was feared might retard production, the industry shows healthy activity and plans for expansion have been formulated at every factory to meet the constantly increasing demand.

The export problem which began to loom large immediately after the armistice has not been solved and as one manufacturer put it, Latin-America, England, France, Italy, Belgium and Sweden are "hungry for cars." In a majority of instances the manufacturers have been giving some little attention heretofore to export trade but they realize that the growing demand makes extensions and expansion imperative.

It is conceded even by the foreign manufacturers that they cannot reach the quantity production to satisfy the demand. Then, too, the American models have made such inroads in popular favor abroad that prospective buyers will not be denied and are showing an inclination to do without until their desires for American cars can be cared for.

Dodge Brothers, who have been in the export market for some years, will make no special effort to increase its foreign business. They contend that it simply is a matter of production and that at present it is a physical impossibility for them to expand their export business save at the expense of their patrons in America.

Paige-Detroit Motor Car Co., with four representatives in the foreign field, has enlarged its export department and devoted much of the output to the foreign trade during 1920.

Scripps-Booth is receiving five orders for every one that can be taken care of and, while every effort will be made to favor the American trade, proposed expansions will care for the export demand more satisfactorily.

The Maibohm Motor Car Co. shipped 20 chassis to England Friday and has greatly increased its facilities for the manufacture of cars for export. Work has been started on the new factory for the Maibohm company and when finished it will be one of the most complete automobile plants in the world.

The Hupp Motor Car Corp. will make a bid for a large portion of the foreign business and will give as large a percentage of its business to export trade as any other manufacturer.

The King Motor Car Co., already enjoying a large share of business in South America, Belgium and England, plans to greatly expand its export trade and to that end is formulating plans for assigning a goodly percentage of its output to the overseas market.

The clamor from foreign distributors easily would consume the entire Cadillac output, according to officials of that company. So insistent are the demands that the officials declare the foreign trade will take every car, with or without wheels.

Foreign demand for trucks is equally great. The Olds Motor Works at Lansing shipped 500 trucks to England last week and additions being completed to the plant will permit the company to devote a much greater portion of its output to the markets outside of America. The Olds company will add 3,000 employes to its payroll within the next six months with the addition of a new finishing and assembly plant, a new sheet metal and enameling plant and an addition to the main assembly plant. The foundry also will require 1,000 additional men.

Manufacturers in a majority of instances plan to increase their production Nov. 1, and by Jan. 1 practically all of the factories will have increased their output from 30 to 100 per cent. The Maibohm company, with a daily production of eight, will start on a schedule of 25 cars a day Nov. 1 and expects to turn out 7,500 during the coming year. The Liberty Motor Car Co., with additions and extensions contemplated, will greatly increase its output during 1920 and then will make a bid for export business.

The reorganization meeting of stockholders of the Saxon Motor Car Co., in New York Nov. 5, is expected to result in a financing program that will permit of additional facilities that will greatly increase production at the plant. The company already is doing considerable export business and is using the foreign newspapers and other advertising mediums extensively. One-third of the present output of the plant now is being sent to the foreign market and with the proposed extensions, in the event the reorganization plan is successful, 50 per cent of the factory production probably will find its way to overseas trade.

Labor conditions in the Detroit district, particularly outside of the city, are good. There is great need in Detroit for good common and skilled labor, but until some comprehensive plan for housing new families is evolved there is little hope for conditions being relieved. The Packard Motor Car Co. is short between 200 and 300 common laborers and between 75 and 100 skilled men. The housing situation is serious and hundreds of employes sent here from the east have gone back after working 60 days.

The W. A. Paterson Co., at Flint, now producing 10 cars a day, will double its output beginning Nov. 1, and even greater expansion is contemplated with the new year.

The Jordan Motor Car Co., which shipped 150 cars to Chile during the present year, contemplates increasing that output to 400 during 1920, though no concerted effort will be made to cut into the foreign trade. The company has a number of dealers abroad and is shipping every car that can possibly be spared though the domestic demand is so great the plant, with extensions under way and in prospect, will hardly be able to go into the export market actively.

October Car Production

	By Leading Makers	
	September.	October.
Buick	500	500
Briscoe	50	60
Barlen	10	12
Cadillac	100	110
Chalmers	75	80
Chandler	90	110
Chevrolet	700	1,000
Columbia	30	30
Dodge	425	400
Dort	100	100
Ford	3,100	3,100
Hudson	100	120
Hupp	50	65
King	10	10
Liberty	35	35
Maxwell	300	375
Oakland	225	225
Olympian	10	10
Oldsmobile	150	150
Overland	260	300
Packard	40	42
Paige	45	35
Paterson	10	10
Jordan	18	18
Maibohm	10	8
Reo	125	175
Saxon	30	20
Scripps-Booth	25	25
Studebaker	165	165
Winton	10	10
Essex	110	120
Grant	20	25
Total	6,948	7,470
Peerless	20	25

Japan Plans Airmail To Encourage Flying

WASHINGTON, Nov. 11—Flying in Japan has not yet reached an important commercial stage, according to a report by Consul A. E. Cook, received by the Bureau of Foreign and Domestic Commerce.

There is at present practically no civilian flying in Japan, although there are a number of civilians who are able to handle machines, having learned the art in foreign countries and at a private school near Tokyo. The cause of the many accidents occurring among Japanese flyers does not seem to be any inability of the flyers to grasp the principles of flying, nor any lack of technical knowledge or application, but rather the lack of able mechanics. The military

authorities have been trying to overcome this difficulty, however, and sent a number of men to Italy for the purpose of studying practical airplane mechanics. This commission has recently returned, and with their aid it is hoped to produce mechanics better able to cope with the situation.

The Department of Communications is contemplating an experimental mail flight from Tokyo to Osaka, a distance of 250 miles. The authorities are encouraging civilian aeronautics, and this mail flight, although it is to be under the supervision of the military aviation service, will be in the nature of a contest between military and civilian flyers, in which two of the latter have already entered.

Three aviation associations have been organized in Japan, including one private aviation school. The names and addresses of these societies follow: The Imperial Aviation Service, Mitsubishi Building Maurnouchi, Tokyo; the National Aviation Society, Yoban-cho, Kojimachi, Tokyo; and Doctor Kishi's Aviation School, Tokyo-fuka.

There have at various times been rumors of the establishment of airplane factories with private capital, but apparently no actual production has as yet been accomplished.

Fred J. Fisher Heads New Ohio Body Company

CLEVELAND, O., Nov. 17—The Fisher Body Ohio Co. was put one step nearer the stage when production will be started when officers and directors were elected

Fred J. Fisher, president of the Fisher Body Corp. of Detroit, will serve in a similar capacity with the Ohio company. Charles F. Fisher will be vice-president; L. Mendelsohn, treasurer, and A. Mendelsohn, secretary.

The company has a capital of $10,000,000 of eight per cent preferred stock, and 100,000 shares of no par common stock, 20,000 of which are issued. The entire issue was three times oversubscribed the day the stock was issued.

LEATHER PARTS COMPANY

INDIANAPOLIS, Nov. 12—The Leather Parts Co., 1619-1621 Prospect, has been organized for the purpose of manufacturing leather parts and leather specialties of all descriptions for the automobile, truck and tractor trade.

The business was formerly conducted under the name of Otto Bunge Co., but has been extended and reorganized. This company has long been known as one of the leading strap and boot makers in this section. With its new organization they have a capacity for a much larger production.

The officers of the company are Arch H. Olds, president, Secretary of the Hide Leather & Belting Co.; A. M. Fodrea, secretary and treasurer, long known as head salesman of the Hide Leather & Belting Co.; and Otto Bunge, vice-president. Mr. C. H. Nigh will be in charge of the sales department.

European Tire Makers Set Standard for Pneumatics

French Manufacturers Continue to Ignore Straight Side Product—Efforts to Standardize Tire Valves Expected—Goodyear to Establish Paris Branch

PARIS, Oct. 25—(Special Correspondence.)—At a meeting of European manufacturers representing France, England, Italy and Belgium, it was decided to limit the sizes of pneumatic tires to the following:

650x 65 m.m.
760x 90 m.m.
815x105 m.m.
820x120 m.m.
880x120 m.m.
895x135 m.m.
955x135 m.m. for trucks only.

The retention of the first two sizes is rather doubtful, for these may later be replaced by the inch size of 30x3 1-2. All these tires have clincher beads. It is understood that the tire manufacturers in the four countries concerned will go into regular production on the above sizes only. Other sizes which may be called for by automobile manufacturers will have to be built especially and consequently will be more costly.

An effort is being made to standardize tire valves. At the present time there are in Europe two sizes of valves, the later of which has a much smaller diameter than the older model. It is intended that the small diameter valve shall be adopted eventually, but up to the present no official action has been taken. America was not present at the European Tire Standards Conference.

The Paris Salon showed that the size of tire which will be most generally employed next year is the 880 by 120. Next in importance is the 710 by 90, which, it will be noticed, does not figure on the list of standard tire sizes adopted by the European committee. Probably the 710 by 90 will be merged with the standardized 760 by 90, which is fourth on the manufacturers' production list. If this is done, the 760 by 90 will be the biggest seller in France, the estimate of manufacturers' requirements for the year being 159,000, compared with 110,000 for the 880 by 120. The big producers in the 710 by 90 and 760 by 90 class are Citroen, Renault and Fiat.

The following shows the relative importance of the different tire sizes and the probable number which will be used by the different French manufacturers. The figures deal only with tires sold on new cars by automobile manufacturers, and do not attempt to cover sales to car owners:

Tires	Manufacturers' Requirements
880x120	110,000
710x 90	*94,000
760x 90	*65,000
815x105	64,000
820x120	62,000
895x135	31,000
765x105	16,500
810x 90	2,400
650x 65	2,800
920x120	800

*Probably all these will become 760x90.

The above figures were decided on by the automobile manufacturers before the Tire Standard Committee had met. It is obvious from these estimates that it will not be a difficult matter to apply the tire manufacturers' standards, for all the big production sizes are included in the tire manufacturers' program, and those not figuring therein are small production jobs. There seems to be no reason, too, why the 815x105 and the 820x120 should not be merged into a single dimension. At the present time the latter size is really looked upon as an oversize for the 815x105, and it is used as such very extensively by car owners.

France has not yet taken the straight side tire seriously. None are built in France and no arrangements have been made for building them. This means that all the American cars now in France, or which later will be imported into France, will have to be supplied with special tires from home, or they will be converted to clinchers in France. Practically all the American firms interested in business in France are determined to ship their cars with straight side tires.

According to H. J. Sturdevant, who represents Pierce-Arrow interests here, all cars sent from the Buffalo factory to Paris have straight sides. A similar statement is made by the representatives of the Dodge company, now in Paris arranging for French representation. General Motors, which is also going to look after the interests of its clients in France, will adhere to the straight side equipment.

In addition to this, a few thousand American touring cars are likely to be brought across the Atlantic next year by parties interested in the battlefields and other portions of France.

The Goodyear Tire Co. has decided that it will take care of American interests in France and of American tourists who come to this country by establishing a branch in Paris and appointing agencies in all the leading centers. Goodrich has a factory in France, but up to the present has only built clinchers, there having been no great demand for straight sides. This firm would soon get into straight side production if the demand were felt.

Panhard-Levassor, who is arranging to come on the American market, has decided to equip all his cars exported to the United States with straight side rims. Delage, who is also selling in America, has not changed his rim equipment. Renault is also shipping with clincher rims.

Truck Sales Manegers Talk Trade at Big Meeting

Larger Rural Sales, Full Equipment and Good Roads Activity Advised by Speakers of National Prominence—40 Companies Represented Tracy President

DETROIT, Nov. 10—The problems of used trucks in sales, the extent to which trucks should be equipped when offered for sale, road conditions, and a review of the prospects for rural sales were the high points in the meeting of the National Association of Motor Truck Sales Managers here Friday and Saturday. Interest in the discussions was manifested by the questions asked the speakers.

Each of the 40 truck companies holding membership in the association was represented. J. E. Tracy of Milwaukee was elected president; H. T. Boulden, vice-president; E. T. Herbig, secretary-treasurer, and J. M. Carney, executive secretary. Chicago was selected for next year's meeting. The sessions were all business, strictly attended to, except the dinner, which was served as an outlet for the two days' pent up enthusiasm and good fellowship.

Among the speakers were Alfred Reeves, general manager of the National Automobile Chamber of Commerce; F. W. Fenn, secretary Motor Truck Committee of the Chamber; A. J. Whipple, general sales manager, Diamond T Motor Truck Co., Chicago, and A. E. Schafer, sales manager of the Gramm-Bernstein Motor Truck Co., Lima, O.

In addressing the convention on "Prohibitive Licensing or Taxing of Motor Trucks and Motor Truck Legislation Generally," Reeves said in part:

Road Destruction

"A number of unfounded criticisms on road destruction from heavy trucks have caused adverse legislation in certain points. For instance, in the city of Cleveland the restriction on weight is 20,000 lb., whereas the state of Ohio limits it to 26,000 lb., and when the matter was taken up before the Supreme Court it was decided that Cleveland could have any local ruling in this respect that it desired. Thus, we have a strange case of the city declaring unlawful what the state has legalized. A great many other laws have developed from legislative bodies that have not been properly informed on such matters, and it is one of the purposes of an organization such as this to work with the legislative bodies to assist them in arriving at intelligent results. The Chapin uniform traffic bill is a good example of work that the Chamber is fostering. The bill is still in a formative stage, but promises to be of considerable importance to the truck industry."

Reeves concluded his address with an invitation to the truck sales managers to present their problems to the Chamber, even if they were not members of the N. A. C. C. He stated that the body was co-operative to a high degree, and although non-members could not participate in the benefits of the organization to such an extent as members, nevertheless the Chamber was always ready to co-operate, even with non-members, in the solution of their problems.

Selling to Farmers

Discussing the problem of selling to farmers, Fenn declared although sales were not being directed to him, the farmer was a larger user of trucks than any single branch of American industry.

"The farmer is buying trucks and still buying them despite the little sales effort to influence him," said Fenn. "The fact that he has bought a product on which he had not been sold previously, a product which has stood up under the severest kind of work, with little or no service behind it, speaks well for the product turned out by the motor truck factories of America.

"While the rural field scarcely has been touched the urban market is fast being sold to capacity. Trucks can not be sold as passenger cars and do not command the same market, therefore transportation should be the keynote in salesmanship. A questionaire sent out in a western state showed that the truck was the busiest piece of machinery on the farm.

"The farmer should be thoroughly educated in the use of the motor truck so that he will understand it as thoroughly as he understands his horse. You sales managers should encourage the farmer to participate in local motor truck owners' associations and you should promote the interests of those associations wherever it is possible. Your advertising should include good farm journals through which to spread the gospel of truck transportation."

He proposed a committee of seven on trade practices, the committee to be made permanent, with the duty of adopting and recommending rules to govern practice as to sales policies and their execution.

"We as salesmen are engaged in one of the most important industries not only of the United States, but of the world," he continued. "Its growth has been rapid and it has before it a wonderful future insofar as the demand for its product is concerned. It remains for its operators of the present day to determine whether that great production shall go forth in its present state of abusive, scurrilous methods or whether through co-operative effort it shall be so governed that the producer as well as his distributor and dealers, who are all important factors in the marketing, shall reap a proper and proportionate return for labor and investment."

Vocational Selling

"Vocational Selling and Vocational Advertising Mediums" was treated exhaustively by L. B. Dudley, advertising manager of the Federal Motor Truck Co., who told of one concern which has selected a list of 3,000,000 possible buyers and had circularized 1,000,000 chosen from that number, all prosperous farmers in the United States.

"Another company spent $20,000 in an advertising campaign through vocational or trade journals and still another spent $125,000 in four weeks," he declared.

Dudley urged schedule and research departments to train and aid salesmen to know every phase of the business of each classification.

"The trade papers or vocational press have great power for good in the development of additional markets for the motor truck," said he. "Charles V. Blackman, of Commercial Vehicle, who realized that point better than anyone else in the publishing field, has arranged 1,800 lines of business which can use motor haulage into 34 classifications and has made a list of publications which can give you a basis on which to base an advertising campaign to dovetail with your vocational sales plan.

"To-day we are on the edge of intensive vocational selling. Our sales methods are weak and our advertising poorly directed. If advertising and sales are co-ordinated to such a degree that they will force their product to the attention of a particular business, then that industry is going to buy more motor trucks."

Used Truck Sales

"Taking old trucks at excess values is dishonest," declared J. W. Allen, manager of the New York branch of the Service Motor Truck Co. "Perhaps 1 per cent of trucks sold are turned in because they are too small or unsuited. Of these 95 per cent should be destroyed. The dealer is contributing to dishonesty in taking in trucks at excess values."

Allen cited one case where a truck was turned in for $800, sold for $350, traded in to another dealer for $700, sold a second time as a used truck and still again traded in. He urged a special committee to take up the problem and evolve a plan for taking in trucks at their real value, taking the parts that are good and demanding from the original seller or the factory the amount they are worth for use in building other trucks. Allen's theme was the "Trade-In Evil," and his paper was liberally applauded by the sales managers.

Truck Equipment

"Should Trucks Be Manufactured and Sold Fully Equipped?" was the subject discussed by A. E. Schafer, sales manager of the Gramm-Bernstein Motor Truck Co., and in which the delegates evinced a keen interest. Schafer declared no truck can be used without some sort of cab and said the reason good teamsters were so hard to get was because they

were not protected from the weather. He stressed the point that no one of his hearers would buy a passenger car stripped and then buy the parts. That, he declared, was the best answer to the question contained in his subject. On the other hand he asked if the sales managers were dealers would they care to sell a truck and then go back after wrestling with the major sale and go after the sale of parts. He urged that few dealers get full price for parts in such instances.

H. H. Shuart, manager of the Detroit Automobile Dealers' Association, read a paper on the "Practical Method of Determining Values of Used Motor Trucks," which brought about much discussion and the interest of the sales managers was demonstrated in the number of questions asked the speaker.

C. R. Talbot, vice-president of the National Bank of Commerce of Detroit, spoke on the "Attitude of Banks in Financing Motor Trucks for the Dealer and Retail Purchaser."

THE TRUCK BUYER

Three hundred sales managers and their guests were present Friday night at the big entertainment feature arranged by the local committee, an instructive address by Norval A. Hawkins, former sales manager of the Ford Motor Car Co., furnishing the vehicle for impressing upon the sales managers that the average truck buyer is just as shrewd as the average salesman and urging a clean-cut policy of integrity in dealing with the prospect. Capt. Eddie Rickenbacker, America's flying ace, told of his experiences in the war. H. S. Firestone, president of the Firestone Tire & Rubber Co., spoke briefly on the duties of educating the purchaser in the proper use of the truck after selling him, and James Schermerhorn, president of the Times company, in a humorous presentation of his views on the duties of the sales manager and happy reference to each of the preceding speakers rounded out the program, which included several vaudeville attractions.

Saturday was devoted to round table discussion of the problems confronting the industry, exhibition of films showing the government cross-continent truck caravan and a report on the sales managers' development tour, featured the closing sessions Saturday.

BOSTON SHOW SANCTIONED

NEW YORK, Nov. 10—The Motor and Accessory Manufacturers Association has officially sanctioned the Eighteenth Annual Boston Automobile Show, to be held at the Mechanics Building, Boston, March 13 to 20, inclusive. Approximately 105,000 sq. ft. of floor space are available for exhibition purposes, and the show next year is expected to surpass all previous records.

In announcing the sanction granted by the Board of Directors, M. L. Heminway, general manager of the association, expressed the opinion that the forthcoming automobile shows at New York, Chicago and Boston would be the greatest in the history of the automobile industry.

Attendance Records Smashed at Paris Automobile Show

Interest in French and American Post-War Models Intense—Many Buyers for Moderate Priced Cars—American Firms Establish Paris Branches

PARIS, Oct. 22—All attendance records have been broken at the Paris Automobile Show just closed. The official figures have not been published, but it is known that on the first Sunday the show was open 96,000 people passed through the gates and more than 90,000 of these paid admission. As the price on that day was 20 cents, the receipts totalled $18,000. This record was beaten on the second Sunday, when the price of admission was increased to 40 cents, and about 50,000 people paid to get inside the Grand Palais, allowing the cashier to take home about $20,000.

In the history of France there has been no such popular enthusiasm over automobiles as at this show. The only time when it was really possible to see the exhibits was in the morning. In the afternoon, from 2 o'clock to 6, the closing hour, the crowd was so dense that it was impossible to do much more than follow round with the mob.

Although there were more high-class and costly cars on view than at any previous show, this exhibition differed from all others by reason of the large number of prospective buyers of cheap and moderate priced cars. Demonstrators in the Champs-Elysées and adjoining avenues had a busy time. Citroen set the pace in this respect by having 50 cars, all alike, with drivers all dressed alike, ready at all time for trial runs. Renault had about 20 cars of different types at the disposal of prospectives and dealers. During the 11 days of the show traffic was so dense in the Champs-Elyées that the police gave up the task of trying to regulate it.

Surprise is expressed everywhere at the rapidity with which France has come back. Three months before the show opened many of the models had not even got into the drawing office, and practically all the factories were busy cleaning up war contracts or reorganizing their plants after having been completely out of automobile construction for five years. Two weeks before the show opened it seemed impossible for exhibitors to be ready, and innumerable reports were spread regarding a postponement. It is probable that some of these rumors were circulated by firms anxious to gain more time.

On the opening day not a single car was missing because of factory reasons, and there was an organization back of the exhibits which showed that France had again stepped into the automobile business with that wonderful dash she displayed so many times when fighting the enemy. Because of the exhibits not being ready until the last minute of the last hour, little advance information had been secured regarding the show, and this served to add to its interest.

In several cases exhibitors were handicapped owing to the poor state of transportation in France. The Berliet stand was empty for the first four days of the show, owing to delays on the railroad line. The Wolseley $8,000 stand stood empty during the whole of the show owing to the English railroad strike. The poor display made by British firms at the first post-war show was much commented on.

All the American cars came to hand, but in the case of General Motors it was necessary to bring the exhibits direct from Bordeaux to Paris on automobile trucks in order to assure their prompt arrival. The Goodyear Tire Co. received its special exhibit on the morning of the last day of the show. The stand, however, was not empty, for when it became obvious that the exhibit from New York would not arrive on time, arrangements were made to borrow tires and tire accessories from the American Army and to secure the loan of Goodyear racing tires from the Peugeot company.

Since the Paris show several American firms have decided to establish headquarters here. General Motors is arranging for a central organization which not only will look after the sale of their different lines, but will assure real American service for their clients throughout the whole of France. The most important asset of General Motors in France is the Cadillac car. This was represented here before the war, and is still looked after by the same dealer. Many Cadillac cars, however, will be put on the French market independently of the dealer, and as he cannot be expected to supply service for sales he has not made, the main organization will step in here.

It is understood that the Goodyear temporary organization in France will be changed into a permanent establishment. A spare parts and service depot of the Buda company has been established in Paris at 29 Rue de la Rochefoucault, with Mr. A. Conro Fiero in charge. The Pierce-Arrow company is forming a French branch and has made complete arrangements for stocking parts for their trucks. A separate department is being

Toward the end of the Paris automobile show the Hispano-Suiza Co. served an injunction on the Gnome & Rhone Co. for infringement of their patent covering the direct operation of valves. This patent is held by Marc Birkigt, Hispano-Suiza engineer, and was applied to all Hispano-Suiza airplane engines built during the war. Hispano-Suiza has practically built the airplane engine into a chassis.

INDIANAPOLIS PLANTS SHOW RAPID GROWTH

City Entering Busiest Period of Its History as Automobile Manufacturing Center

INDIANAPOLIS, Nov. 5—Indianapolis as an automobile manufacturing center is entering the busiest period in its history. A period of expansion, which has been going on for three years, is bursting into prominence and is drawing the attention of the automotive field. In addition to such automobile factories as the Cole, Nordyke & Marmon, National, Stutz, Premier, etc., the Lafayette Motors Co. is soon to enter manufacture and there is a probability of one or two large factories entering the field in this city.

Every one of the companies located in Indianapolis has shown a steady growth and expansions are contemplated. For instance, the Cole Motor Co. expects to be building 12,000 automobiles annually by Jan. 1. Although the new buildings will not be completed by that date, the units which will be done by that time will enable the company to increase to 12,000 cars. When the remainder of the buildings are occupied this production will be augmented.

When the units now building are completed, the work space of the Cole company will be approximately 600,000 sq. ft., or more than two and one-half times that now in use. The contemplated production for 1920 will bring the output to more than three times what it was in 1918 and almost twice that of 1919. By the end of 1920 it is planned to be on a 20,000-car-a-year basis. At the present time the Cole company is shipping between 30 and 40 cars a day, and during October shipped in excess of 850 cars, the largest month in factory records. The fiscal year, which ends Dec. 1, will show a gross business of approximately $14,000,000. The 1920 aim is $30,000,000. Recently the company paid a 20 per cent cash dividend and the rate for the 11 years the company has been operating exceeds that percentage.

Nordyke & Marmon will be up to a daily production of 20 cars by Jan. 1. The total floor space by this date will be 1,100,000 sq. ft. This is an increase of 700,000 sq. ft. in two years. By Jan. 1 Marmon will have 5,000 employes, an increase of approximately 2,000 over January, 1918.

The National Motor Car & Vehicle Corp. has an expected daily production of 20 by Jan. 1. At that time it will be occupying a floor space of 275,000 sq. ft., an increase of 20,000 sq. ft. in two years. By Jan. 1 the number of employes will be 1,500, which is double the number employed on Jan. 1 of last year.

These figures are indicative of the growth of the industry in Indianapolis. All of the factories are taking on men.

The recent changes in the ownership of the Premier company will not effect the program for expansion. It is expected that by Jan. 1 production will be from eight to 10 cars daily. The floor space of this factory remains at 300,000 sq. ft., this not having changed since the occupancy of the large new plant three years ago. By Jan. 1 the Premier company will have between 800 and 1,000 employes.

The Lafayette Motors Co. will not be in production, except in an experimental way, until spring. It is very probable, however, that this concern will have cars at the shows. The floor space taken is between 150,000 and 200,000 sq. ft. and the site includes 25 acres. This organization is backed by the Nash interests and a big future is predicted. It is in the hands of extremely active and previously successful management and should become one of the big factors in the car producing business.

The change in the Stutz organization has brought plans to greatly increase its output.

Publication of this issue of Automotive Industries has been delayed until Dec. 10 by conditions over which the publishers have had no control. Further issues will be forthcoming as rapidly as they can be printed.

Switzerland Adopts Commercial Aviation

WASHINGTON, Nov. 11—Commercial aviation is just beginning in Switzerland, but it is probable that it will grow continuously, according to a report from the Geneva consul. There has been organized a regular airplane mail and passenger service between Geneva and Zurich, via Berne. This service commenced on Sept. 1, 1919, with the following schedule:

Leave Zurich at 10 a. m.; Berne 11:05 a. m.; Lausanne, 12:05 p. m. and arrive Geneva 12:40 p. m.

Leave Geneva at 2 p. m.; Lausanne 2:40 p. m.; Berne, 3:35 p. m., and arrive Zurich 4:30 p. m.

The cost of a ticket from Geneva to Zurich and return is 500 francs; for a ticket to Berne and return, 300 francs, etc.

In addition to the regular postal charge, a special 50 centimes (10 cents) stamp must be affixed to each letter. Small packages weighing up to 1½ lb. will be carried at the rate of 50 centimes (10 cents) for each half-pound.

TOLEDO SHOW DATES SET

TOLEDO, O., Nov. 8—Toledo Shows Co. directors have fixed Feb. 2 to 7 as dates for the automobile show, the dates being set one week after the Chicago show to permit displays from that show being brought to Toledo. The exhibition again will be held in the Terminal Auditorium, and an elaborate decorative program, involving a large expenditure has been outlined.

CANADIAN DEMAND EXCEEDS SUPPLY

American and European Makers Expanding Factories —More Enter Field

TORONTO, Nov. 5—Progress and prosperity are going hand in hand in Canadian automotivedom as never before.

The Canadian "motor cities" on the Michigan border and the Western Ontario centers boasting automotive and allied industry plants, revealed a universal "oversold" condition. Practically all the Canadian automotive manufacturers are constructing extensions and additions with a view to doubling production next year.

At Oshawa, where additional extensions and new factories are fairly jumping up, to say nothing of a vast number of workingmen's homes, there will be the largest single industrial plant of any kind in the Dominion. It will be largely devoted to the production of McLaughlin, Chevrolet and Oldsmobile cars and trucks and will constitute, for some time at least, the largest of the Canadian General Motors factory units. New automotive plants are being constructed, or are about to be constructed, in most of the industrial centers of the province, especially in Western Ontario. The Willys-Overland, Ltd., has considerably extended its properties with a view to presently largely increasing its factories in Toronto.

Many American automotive companies, several English ones and at least one European company (Fiat of Italy), according to apparently excellently informed authorities, are about to build plants in Canada.

Meanwhile car and truck demand still far outstretches supply. It is said by many leading authorities that even with the planned doubling of production output will not as closely approximate demand as in pre-war days for a year and a half at least, and probably not for two years or more.

Twelve makes of cars (11 American, one Italian) are offered here today not represented three months ago in Canada, and this expansion is said to be but an indication of what is to come, for as yet the British and French manufacturers have not been able to resume production on a sufficient scale to permit of their entering the Canadian field, and many well-known United States car and truck makes have not as yet established distributers in the Dominion. This is rather remarkable, for when the 65 per cent (that Canadians have to pay over and above the American price for cars) is taken into consideration, the Dominion has, roughly, 12½ per cent more per capita invested in motor cars than has the States. Only four cities in the world with an equal or larger population than Toronto have a per capita motor population equal to or larger than has this Queen City of the Dominion.

LAUSON TRACTOR HAS MORE POWER

Is Fitted with Air Washer of Novel Construction—Engine Larger

NEW HOLSTEIN, WIS., Nov. 8—During the coming year the John Lauson Manufacturing Co. will produce only one size of farm tractor, which in many respects will be similar to last year's model. The engine will be of larger displacement, however, having a bore of 4¾ and a stroke of 6 inches, and it will be equipped with a gear-driven fan instead of the belt driven one.

Among the features of the engine may be mentioned the extremely rigid crankshaft, which is 2⅜ inches in diameter, and made of chrome vanadium steel; heavy four-bolt connecting rods, with the bearings sweated in the rod so they cannot come loose, a dual oiling system, combining force feed to the crankshaft and crankpin bearings under a pressure of 20 lb. p. sq. in, and in addition splash within the crankcase. A Sylphon thermostat is now fitted as regular equipment, which insures that the engine will quickly heat up when first started and which thereafter maintains the jacket temperature between 160 and 180 deg. F.

Undoubtedly the most interesting feature of the new Lauson is the siphon air washer, a design original with the company and on which a patent has been applied for. In this air washer water is sucked into the air stream and the principle of action is, therefore, very similar to that of a carbureter. It will be readily understood that the amount of water entering the inlet passage varies automatically in accordance with the load on the engine. After the mixture of air and water leaves the curved tube, it impinges against an inclined partition wall between the upper and lower chambers of the air washer, and as the velocity of the air at this point is relatively low, part of the water forms into drops and separates. The air then passes to the upper or separator chamber, where, as a result of the greatly reduced velocity and properly placed baffle plates, the surplus moisture is deposited. The water from this upper chamber returns to the lower one.

It is pointed out that the water entering the curved tube through the slot therein depends only very slightly upon the water level and almost entirely upon the suction force. It is, therefore, not necessary to provide a constant level chamber with float. It is claimed that the device, when properly fitted to the engine, does not produce any appreciable vacuum. As the air does not pass through the water chamber, the water therein remains in a state of rest and allows the solid matter that is washed out of the air to settle to the bottom of the reservoir, whence it may readily be drained off. The container itself is of cast iron and all sheet metal parts are made of Armco iron. Large clean outs and filler fittings are provided and covers for same are held in place by clamping devices.

A Thermoid-Hardy flexible coupling is inserted between the engine and transmission. Two brakes are now provided on the differential shaft, each serving to lock one of the driving wheels. The chief object in providing this brake construction has been to facilitate turning of the tractor in soft ground.

An adjustable canopy sun shade is furnished as regular equipment.

CHRYSLER RESIGNS FROM GEN. MOTORS

NEW YORK, Nov. 10—Walter P. Chrysler has resigned as vice-president of the General Motors Corp.

Chrysler was one of the General Motors officials who made a tour of Europe to study conditions with the view of establishing branch manufacturing plants abroad. He was president of the Buick unit of General Motors and he is credited with guiding that company to the position it now holds as the largest producer in the General Motors group.

A report that Chrysler resigned following a disagreement with President W. C. Durant over policies was not confirmed. General Motors officials in Detroit refused to discuss it.

The recent announcement of the resignation of Chrysler, issued by President Durant in New York, carried the information that Chrysler had severed his connections with General Motors and that it was understood he was to engage in business on his own account.

In confirming the report of his resignation, Chrysler declined to make any statement regarding the events that led up to it. He denied that his action was precipitate and said he had tendered his resignation several days prior to Nov. 1, the day upon which it became effective.

Chrysler said he had no plans for the future.

Winther Announces New Passenger Car

KENOSHA, WIS., Nov. 10—A Winther six-passenger car has been announced by the Winther Motor Co.

The Winther engineers have been designing and developing this new job for more than a year, according to M. P. Winther, president of the company, who describes it as "a 'six' of the very latest design, with an unusually efficient power plant and a body unique in its simplicity and graceful lines."

No description of the new car has been given to the trade, but it is understood that the complete specifications will be announced within a short time. Factory officials express the hope that the job will be in quantity production early in the Spring. The first deliveries are expected to be made early in January or as soon as possible thereafter.

The announcement that the Winther company was to widen the scope of their truck manufacturing activities by entering the passenger car field caused no small sensation when made at a convention of distribution at the factory.

BELGIAN AGENTS SUE U. S. TRACTOR MAKER

Claim $2,188,830 Commission on Sales of Holt Mfg. Co. Tractors to Allies

NEW YORK, Nov. 12—Claiming $2,188,830 in commissions on more than $40,000,000 worth of caterpillar tractors sold to the Allies for war purposes, Jules Schnerb and Joseph Wegimont, of Antwerp, Belgium, have started suit against the Holt Manufacturing Co., tractor makers, of Peoria, Ill.

The action is brought in New York, and alleges that the plaintiffs are entitled to an accounting concerning the sale of thousands of tractors in Western Europe.

The Belgian agents allege they were appointed exclusive agents for Western Europe and that in 1914, at their plant in Belgium, they gave special and private demonstrations to an English representative who at once reported to General (then Colonel) Swinton, of the Imperial Defense Committee, the great possibilities of the machine for wartime purposes. Colonel Swinton is reported to have said that the report first gave him the idea of using the caterpillar tractor in tank construction.

Thousands of the machines afterward were purchased by the French Government for mounting the famous 75 mm. guns. On all of these sales the agents claim 5 per cent commission. The action is brought through W. H. Page, 66 Liberty street, New York.

Canadian Ford Buys Dominion Forge Co.

FORD CITY, ONT., Nov. 10—An industrial transaction of major importance was consummated in Ford City, Ontario, last week, when the Dominion Forge & Stamping plant was purchased by the Ford Motor Co. of Canada. The property in question is situated at the south of the Grand Trunk lines, near the Ford plant. The Dominion Forge & Stamping Co. has been engaged in the manufacture of fenders, sheet metal work and frames for the Ford Co. The purchase of the stamping plant means that the motor car firm will make these parts itself, and will leave the Dominion Forge Co. free to make forgings and other parts in its second plant. An inventory of the plant involved in the sale was commenced recently and it is anticipated that the final valuation will be between $700,000 and $800,000.

Expansion of the forging plant by the Dominion Forge Company to take care of the larger requirements will probably be an aftermath of the transaction.

WAPPAT GEAR TO BUILD

PITTSBURGH, Nov. 7—The Wappat Gear Works has increased its capital stock, acquired land and proceeded to erect a large modern building in Meade street, here. The new plant will be in operation in December.

BRITISH FORD DEALERS RETURNING SATISFIED

No Attempt to "Crucify" Any Dealer Insists Anderson —Policy Explained

DETROIT, Nov. 8—W. C. Anderson, Ford Motor Co.'s British representative, who came to Detroit to give his side of the story of the controversy with Ford dealers in the United Kingdom, declared on the eve of his return this week that the troubles had been ironed out and representatives of the dealers had returned to England thoroughly satisfied.

Incidentally, Anderson added, the agreement reached was identical with that offered by him before the mass-meeting at which Roland Winn and E. F. Easton were designated to come to America to present the dealers' side to Ford officials. Winn and Easton spent several days in conference with officials at the Ford plant and in departing expressed themselves as satisfied with the explanations offered.

Details of the controversy, rumblings of which reached America some time ago, were outlined by Anderson, who maintained that there had been "no attempt to crucify any dealer or disrupt any organizations." On the other hand, he said he, as representative of the Ford Co., simply insisted upon putting into effect in England the sales policies existing in this country.

"The result has been that we have built up a selling organization among the retail dealers such as they never had before," said Anderson, "and the dealers are tickled to death. It was natural there should be some complaint from distributers who, in the past, had controlled a string of dealers in their territory. They could not see the Ford plan of dealing direct with the retailer.

"The policy of refusing exclusive sales privilege to Ford dealers also brought about some opposition. We contended throughout that the policy existing in America, whereby the Ford Co. is the judge of the number of Ford agents permitted to operate in a certain territory, was the only proper one. If a dealer's business and the business of the territory in which he is located justifies his appointment as Ford agent he will be selected, the power of appointment at all times resting with the company.

"There are 1,100 dealers in the United Kingdom who have been handling Ford cars. We have not yet told a one of them that he would not be reappointed agent. We have, however, determined to make a thorough investigation of the merits of the claims of all of them, and the best will be selected.

"That does not mean that any man now operating as a Ford agent will be ousted from the organization. We intend to take care of everybody. It does mean that only the better class of dealers will be given agencies, with ample protection afforded the little fellow who conducts what practically is a service station and whose business does not justify his being made an agent. That man is to be taken care of under a service agreement whereby he will work under a dealer near him and receive a commission for all cars he sells. We want to take care of every good, legitimate dealer in England and at the same time we do not want to jeopardize the interests of the dealer by forcing him to compete with the service station agent on like terms.

"The Ford Motor Co. is a member of the Motor Traders' Association and we are not going to get out. Winn appeared to labor under the apprehension that we were, by our action in eliminating the objectionable clause, planning to get out of the organization and oppose its principles to the extent of refusing to permit Ford dealers to handle other lines. We will remain in the Motor Traders' Association but we will insist that the Ford dealer be a Ford dealer in reality and not use the Ford agency as a meal ticket while handling a half dozen other makes of cars on which a larger commission offers an incentive toward salesmanship.

"We want proper representation just as we have it in America. That we have and will demand and it cannot be had under conditions such as formerly existed.

"I had heard a great deal about the discontent that had been engendered in certain circles and which plainly was being fostered and aggravated by the attitude of individuals here and there, but it took no tangible form until the mass-meeting, the day following my departure from England, of the Agents Section, Ltd., of the Motor Traders' Association.

"Included in that meeting were about 40 or 50 dealers who already had been fixed on contracts, including Easton and Winn, the former of Birmingham, the latter of Leeds. As a result of a resolution adopted at the meeting, Winn and Easton were instructed to come to America to discuss the situation with Ford officials and incidentally take up with them the problem of distribution of a bonus of one-third of 1 per cent. Heretofore that bonus had been turned over to the Motor Retailers, a subsidiary of the Trades Association, but that clause also was abrogated and plans now are being perfected for diverting that bonus to a charitable fund maintained by the organization.

"It was no surprise to me to find that the object of the visit of Easton and Winn was primarily for the purpose of urging a reversion to the old method of distribution and sub-dealer, but that is out of the question and the trip of Winn and Easton was useless insofar as that particular phase of the controversy is concerned.

"As to the outcome of their visit, I, as representative of the Ford Motor Co., will not drop the Motor Traders' Association. We want to do everything to promote dealers' interest and not crucify anyone. We have not turned down a dealer in England. All of them will be handled exactly as they are in America and appointments will be made following the investigation of the man's capabilities and his selling organization. Every dealer, large or small, will be cared for as dealer or service agent, selling for a certain dealer on a commission. Every dealer will have a fair hearing on his claims for the agency. Discussion of any other clauses in our contract will be taken up when I get back to England."

Anderson said the controversy arose over the fact that 14 distributers without any selling organization were controlling the distribution of Ford cars to the trade. He said he called those distributers in first of all and informed them that the direct-with-the-dealer policy would be insisted upon by the Ford Co., which necessarily compelled them to organize and drill a competent retail sales force. He declared there was not a dealer in England complaining about the Ford contract terms, and attributed all the trouble to the attitude of the men who objected to being relieved as distributers. He said Winn and Easton told officials of the company they were perfectly satisfied and would make a favorable report on the contract and agreement upon their return to England.

WISCONSIN TO HAVE STATE ASSOCIATION

Movement for Single Organization of All Automotive Interests Is Launched

MILWAUKEE, Nov. 10—A movement to bring all interests identified with the automotive industries of Wisconsin into a single organization which probably will be called the Wisconsin Automotive Federation, has been started with the intention of bringing it to a head by means of a big convention to be held during the annual Milwaukee show in the Auditorium in January. The proposition is made by members of the Milwaukee Automobile Dealers, Inc., the success of which organization is believed to form a splendid example of what can be accomplished through thorough organization.

Bart J. Ruddle, assistant secretary and manager of the Milwaukee dealers, has been in communication with leading dealers throughout the state and reports an enthusiastic response to the suggestion. Besides safeguarding the welfare of the business interests represented by members, the proposed new organization is intended to take an active part in the good roads movement, county bond issues for highway construction, legislation of all kinds pertaining to the business and use of motor vehicles, including aircraft.

The state association would be suborganized into divisions for passenger car, truck, tractor, power farm machinery, automotive equipment, tire and supply dealers, with an associate membership class for miscellaneous branches of the automotive industries, including trade and technical publications.

The dates of the Milwaukee show, which will be the twelfth annual, will be definitely set within a short time. At the close of the 1919 show last January, a reservation of the Auditorium was made for 1920, but these dates conflicted with the Chicago National show and this makes it necessary to rearrange the schedules.

TRUCK SERVICE IS PLANNED IN LONDON

Freight Rates Advance, Following Rail Strike, Hastens Consideration of Project

LONDON, Oct. 17—(Special Correspondence)—The movement toward developing transportation by motor truck is likely to be stimulated by the recently disclosed intention of the Government—which still retains control of the railways—to raise the rail truck rates, by, it is anticipated, 50 percent. Leading daily papers are making a bid in this truck development by giving prominence to advertisements of traders and others seeking return loads, besides continuing to print much editorial matter and articles focussing attention on the congested state of traffic, the supreme need of its being organized, and its collection and distribution co-ordinated at once.

It also happens that at the moment a big scheme of traffic concentration through a series of clearing houses working in conjunction with road motors, is before a committee appointed by the legislature. Technical witnesses of all kinds are being examined, and the rail interests are putting up a big defense against the charges of waste, loss of trade, delays and other defects peculiar to British railways.

The promoter of the scheme is A. W. Gattie, who proposes to equip, at a cost of some millions of dollars, a clearing house in London, which he says would enable all the present rail goods terminals to be scrapped. The building would be a high skyscraper of many stories, fitted with a maze of transfer-bays and connected by patent electric traveling ways, controlled by switches, enabling any skip (box-truck) to be self-tracking to the appointed bay; the bays representing the various subdivisions of traffic distribution corresponding to the district areas of the whole country. It is obvious that such a scheme will require almost wholly package baskets or boxes filled with the goods, and motor trucks with platforms suited to carry a number of such boxes, ready to be lifted and lowered by power into position on and off the trucks.

Gattie estimates a daily requirement of 5,000 motor trucks to work his proposed London traffic exchange. This figure is not over large, because during the recent rail strike the Government was using throughout the country 25,000 motor trucks, and would have added to the number weekly some 400 to 500 trucks, most of them returned from war service.

However, it may be useful to set down points from the evidence of one of the railway witnesses in opposition to Gattie's scheme. Gattie estimated that the cost of the motor trucks required would be $8,000,000, but the rail companies put the figure at $35,000,000, representing 27,000 road trucks to $2,500 a truck, which obviously is a pre-war figure and should be trebled for present rates.

Gattie estimated that 30,000 baskets or boxes would be needed; the railway interests believe that 54,000 would be necessary, on a basis of 3,360 lb. (1½ British tons) a box. The figures quoted refer only to London traffic. The railway experts seem agreed that there is room for much greater expedition in getting traffic cleared from terminals. To meet this need it is necessary to use motor trucks of 6,000 to 7,000 lb. capacity, and to rearrange and equip the wharves and terminal stations with quick-lifting appliances and of standard patterns, and in sufficient numbers for all pressure. Little success has attended efforts to equip road trucks with self-contained power hoists.

New Orleans May Get the 1920 Road Races

NEW ORLEANS, LA., Nov. 11—Fred J. Wagner, official starter of the American Automobile Association, announced Saturday that he would recommend the holding of the 1920 road race of the association in New Orleans.

Wagner stopped here one day on his way to open the racing season at the Ascot Speedway, Los Angeles, and will return here next week to confer with dealers and the Louisiana-Mississippi Automotive Trades Association officials on the time and place for the 1920 road races. It is planned to hold these races the two Sundays preceding the Mardi Gras carnival, which opens Shrove Tuesday.

The proposed routes are seven miles along the New Basin Canal and the mile track at the Fairgrounds Race Course, but Wagner would not indicate his preference though he said "each of them combines to a greater extent than I have seen elsewhere the possibilities of fast time, safety to drivers and convenience for the crowds to see the races. I believe New Orleans can have the greatest road racing course in the United States."

Expansion Program for the White Co.

CLEVELAND, O., Nov. 8—Stockholders of The White Co. will meet at offices of the corporation in this city on Dec. 12 to pass upon a recommendation of the directors that the capital stock be increased from $20,000,000 to $25,000,000.

This increase is needed to expand the factory buildings, which no longer are adequate for the corporation. With a view to providing additional manufacturing space, the company has been increasing its real estate holdings. An extensive building program has been going on at the plant for some time and this when completed will greatly increase production.

The company also is just completing a great service station at Long Island City. It erected a similar building in Philadelphia within the past few years. Further developments include the purchase of land for a service station in Chicago, while just recently the company acquired by purchase a good sized parcel in Atlanta for a sales and service station.

NOVEL GUN CARRIAGE AT PARIS EXHIBITION

Poor Display Responsible for Little General Interest in War Vehicles

PARIS, Oct. 22—Comparatively little attention was paid by the general public to the war vehicles exhibition forming a section of the Paris automobile show. This was largely due to the poor display, which was under the control of the Secretary of War, but did not at all adequately represent the automobile service of the French army.

The most interesting item of this exhibition was the special automobile-type gun carriage for the 155 mm. French long-range gun. This is a 4-wheel trailer gun carriage, built entirely on automobile lines, and hauled by Panhard or Latil 4-wheel drive gasoline tractors. The carriage is composed of two very deep frame members with, at the rear, an arched axle and a very heavy transverse spring. The front portion is exactly on automobile lines, with a forged open jaw axle, semi-elliptic springs, and transverse tie bar behind the axle. The springs are attached to short automobile type frame members, which in their turn are bolted to the main frame members of the gun carriage. Wheels are same size front and rear, being cast steel with dual rubber bandages of 1160 by 120. There is a wide space between the two tires to fit chains and studs. Brakes are fitted on the rear wheels.

On the road this gun carriage is hauled behind the 4-wheel drive tractor, with one man in charge of it to apply the brakes. When going into action quick acting jacks at each corner of the carriage raise it sufficiently to prevent the springs being brought into action. During the war this gun carriage was built in large quantities by the Renault Co.

The exhibition revealed the use of Peugeot creeper band type tractors for hauling the French 75 mm. field piece and for supplying it with shells. This tractor, which is now being used for agricultural work, carried the entire gun crew, and a supply of shells, and hauled the gun and its limber. When the gun had been put into position the tractor was made use of to bring up supplies of ammunition. The use of this tractor in connection with the artillery service was not generally known outside military circles.

The De Dion Bouton anti-aircraft gun car was also shown. This is an 8-cylinder job on pneumatic tires and carries a 75 mm. gun designed to fire at any angle up to the vertical. Special jacks are fitted to the rear of this vehicle to take the load off the springs when the gun is in action. This vehicle is attended by a similar car which carries ammunition and is provided with a range setter.

Methods of carrying 75, 90 and 155 mm. guns on ordinary platform trucks was also shown. These trucks are not in any way special, but new methods were devised of loading the gun on the truck platform. These various systems had been well worked out before the war came to a close.

AUTOMOTIVE EXPORTS DURING SEPTEMBER

Figures for Other Countries Show Gains and Changes for Every Market

WASHINGTON, Nov. 10.—Announcement of the detailed figures for the automotive exports for September were made here today, giving in full the shipments briefed in the last issue of AUTOMOTIVE INDUSTRIES and adding complete figures for the exportations of tires and gas tractor engines for the September period. Slightly lower totals for the latter equipment were revealed, the comparisons with August being as follows:

	Tractor Engines. No.	Dollars.	Tires. Dollars.
September	1642	1,489,688	2,120,477
October	1655	1,554,193	2,351,064

No other decreases, as compared with the preceding month, were shown in these detailed tables which are published in full on the opposite page, except a decline of some few thousand dollars in the value of exported passenger cars. Trade continued on the upward swing, with cars and trucks, however, going to fewer countries than in August.

The tables herewith show the exports listed for "other countries," as have featured the reports for many years. They supplement and enlarge upon the announcement of last week.

In view of the war situation, the return of Austria-Hungary to a place in the table is of more than passing interest, although little hopes are held forth of that country becoming a worth-while market for perhaps many months. Nevertheless, the reports, show that section of Europe to have received cars and tires valued at $15,000.

By far the most important places on the tables are taken by France and England. The former country showed takings of 365 trucks, valued at more than $1,700,000, and was by far the heaviest importer of that equipment. France likewise purchased heavily on the tractor engines. Nearly a third of the total exports were to that country, the totals showing a total of 509 valued at $512,558. The Canadian tractor engine imports from this country, as might be expected, were in excess in number of those of the war-torn European nation but the value was not so large and consequently France is entitled to he honor of being teh premier purchaser of such American machines.

The Italian market still continued light, the bans there apparently not being lifted to American goods. England, as previously stated, doubled her takings of American cars, with the lifting of the import restrictions, but still refused to take trucks made in this country, no more than five being shipped there during the month under discussion. England, however, was a heavy purchaser of American made parts, perhaps taking many trucks knocked-down that are billed in that way but which are set up and sold as complete units there.

The Scandinavian and adjacent markets of Northwestern Europe continue to show profitably, their purchases being such to indicate that difficulty may be had by European makers to supplant the American products. Outside of Europe, Japan and China increased certain of their purchases and South American countries showed, on the whole, but little variation from the previous month.

One expected and unexplained feature of the tractor reports was that showing a shipment of ninety-one engines, valued at $111,200, to the almost unknown French Africa. Only France and Canada bought heavier than did this district, which, in August, took only nine of the American machines.

Tractor Maker Will Build Passenger Job

LOS ANGELES, Nov. 7—Announcement is made that the Moreland Motor Truck Co. of this city will undertake production of a passenger car as well as a field tractor. The company now has under construction at Burbank a new factory building, and it is said the intention is to use the present factory in Los Angeles as a service and sales station in the future and do all the assembly work at the Burbank plant. If the plans as drawn up are executed completely the Burbank factory will provide ample room for both the passenger car and tractor departments.

A statement has been issued in which it is announced that the passenger car will be of the six-cylinder type and have a wheelbase of 118 inches. It is proposed to offer three body types. Disc steel wheels will be used as standard equipment and the cars will have what is known as the "California" top with rolled celluloid curtains. At this time it looks as if stock in the passenger car factory, which, it is said, will be operated apart from any connection with the truck concern, will be placed on the open market.

Watt Moreland, who will head the new company, was connected with Alexander Winton in the early days of the Winton car. Later he was identified with the Haynes manufacturing organization. Upon coming to Los Angeles he became connected with the company that was making the Tourist automobile and later was concerned in the production of the Duro, both of which companies now are extinct. He has been assembling the Moreland truck here for nine years.

Year Is Car Theft Penalty in Canada

TORONTO, Nov. 7—One year's imprisonment has been fixed by the Dominion Parliament as the minimum penalty hereafter in cases where a conviction is made for theft of an automobile. The law is now in effect and already under its authority a number of motor thieves are serving terms of a year who might otherwise have been leniently dealt with by the courts.

House Votes to Force Army Cars on Market

WASHINGTON, Nov. 10—The House of Representatives yesterday adopted a resolution designed to force the Army surplus passenger cars and motor trucks on the market.

The resolution came from a subcommittee of the select committee on expenditures in the War Department. It "requests" the Secretary of War "to deliver immediately to the Secretary of Agriculture for distribution among highway departments for use on roads constructed in whole or in part by Federal Aid, the 22,195 motor vehicles for which requisition has heretofore been made by the Secretary of Agriculture and that all other Army motor vehicles now or hereafter declared surplus be immediately offered for sale at public auction."

High Land Prices Change Ford Plans

MT. CLEMENS, MICH., Nov. 10—Ford Motor Co. officials announced that the profiteering attitude assumed by farmers seeking to sell property as a site for an auxiliary automobile and tractor plant here had resulted in cancellation of negotiations. The farmers demanded $200 an acre for pasture land. The plans contemplated the purchase of approximately 5,000 acres and the erection of a plant to cost $500,000 and to be operated by hydro-electric power.

Another plan which is being pushed proposes operation of the plant six months each year allowing the workmen to go into the fields after April 1 and labor on the farms and the use of the large dam only during the period of operation, allowing the river to resume its normal course during the remainder and giving the farmers opportunity for use of the pasture lands.

British Molders Curb Motor Output

LONDON, Oct. 29—(Special Correspondence.)—The strike of iron molders which has been going on for several weeks and which was hoped to terminate a few days since, but the terms were rejected by a vote of the men, is beginning to affect motor output. It has already closed a number of other branches of engineering works and a settlement seems likely to be postponed indefinitely. The men demand a $4 a week increase to meet the cost of living. Some of these men are drawing $30 a week.

There is much mutual blame between the parties to this dispute, the fact admitted being that both sides were content to go on ill-equipped as to up-to-date plant and methods. So far as the motor trade is affected, orders are being sent to the United States for castings and stampings for quick delivery, and there will be some chassis at the Olympia Show with cylinder castings brought by airplane from Belgium.

Automotive Exports from the United States by Countries During September

Countries	Trucks No.	Trucks Dollars	Cars No.	Cars Dollars	Parts Dollars	Tires Dollars	Gasoline Tractor Engines No.	Gasoline Tractor Engines Dollars
Austria-Hungary	....	.....	7	10,000	.....	5,000	....	.....
Azores and Madeira Is.	....	.....	....	.....	550	.....	....	.....
Belgium	67	104,790	207	284,601	24,121	129,161	20	12,460
Denmark	112	221,284	296	369,513	320,870	192,511	98	59,744
France	365	1,786,414	92	127,465	63,335	41,317	509	512,558
Gibraltar	....	.....	....	.....	675	.....	....	.....
Greece	....	.....	17	33,108	5,580	1,384	....	.....
Iceland and Faro Is.	11	6,030	17	13,959	3,008	12,780	....	.....
Italy	....	.....	4	4,600	1,204	.....	6	11,520
Malta, Gozo, and Cyprus Is.	....	.....	....	.....	81	.....	....	.....
Netherlands	16	32,866	108	146,397	6,401	152,584	11	14,865
Norway	63	99,153	153	175,135	16,317	55,252	....	.....
Portugal	....	.....	3	2,205	.....	.....	....	.....
Roumania	2	5,702	27	97,860	21,322	4,486	2	3,300
Russia in Europe	....	.....	1	580	.....	152	....	.....
Spain	12	24,820	101	108,137	12,322	7,594	24	33,947
Sweden	51	124,153	353	384,840	19,879	261,709	....	.....
Switzerland	1	1,570	42	35,622	2,170	.....	3	3,742
England	5	5,657	964	875,571	1,234,846	18,023	72	70,475
Scotland	....	.....	4	8,325	1,731	.....	....	.....
Ireland	4	7,231	12	10,656	.....	.....	....	.....
British Honduras	....	.....	....	.....	683	47	1	1,550
Canada	195	318,866	793	955,150	1,866,358	113,697	603	461,013
Costa Rica	....	.....	2	3,852	563	232	....	.....
Guatemala	2	2,361	14	22,610	1,854	4,434	....	.....
Honduras	2	1,529	1	800	2,300	2,217	....	.....
Nicaragua	2	1,008	8	6,794	3,164	5,641	....	.....
Panama	1	2,529	18	16,159	7,346	54,314	2	6,477
Salvador	....	.....	10	18,380	2,275	2,444	....	.....
Mexico	154	123,100	213	135,355	46,513	61,338	14	18,898
Miquelon, Langley, etc.	....	.....	....	.....	84	.....	....	.....
Newfoundland and Labrador	....	.....	19	24,854	2,119	3,939	....	.....
Barbados	2	1,007	13	8,615	1,317	7,135	5	2,731
Jamaica	....	.....	12	10,079	10,198	13,106	....	.....
Trinidad and Tobago	2	5,400	6	4,386	5,052	3,968	....	.....
Other British West Indies	....	.....	5	4,310	837	900	1	1,250
Cuba	40	78,211	190	209,819	68,147	87,232	18	10,967
Danish West Indies	....	.....	2	1,000	246	613	....	.....
Dutch West Indies	....	.....	....	.....	488	1,253	....	.....
French West Indies	9	18,883	26	20,234	7,705	22,028	3	2,599
Haiti	....	.....	10	5,724	4,254	5,238	....	.....
Dominican Republic	6	11,010	11	7,099	6,964	7,582	....	.....
Argentina	37	68,386	209	250,888	310,804	138,019	31	28,609
Bolivia	....	.....	....	.....	353	4,359	....	.....
Brazil	6	3,023	202	193,101	71,305	49,085	1	155
Chile	....	.....	22	28,410	18,909	17,911	16	1,728
Colombia	....	.....	35	38,165	6,606	15,500	2	2,200
Ecuador	2	1,540	3	3,468	3,656	6,066	....	.....
British Guiana	2	3,682	....	.....	2,592	867	....	.....
Dutch Guiana	....	.....	....	.....	275	.....	....	.....
French Guiana	....	.....	1	1,200	22	.....	....	.....
Peru	20	12,565	37	26,055	4,902	12,401	22	19,338
Uruguay	....	.....	62	61,274	15,278	36,487	....	.....
Venezuela	....	.....	12	17,951	9,109	52,225	....	.....
Aden	....	.....	6	3,500	1,349	1,644	....	.....
China	4	6,221	88	92,649	19,776	18,797	1	2,038
Chosen	....	.....	....	.....	3,056	223	....	.....
British India	31	84,255	261	289,207	19,406	29,557	26	17,686
Straights Settlements	....	.....	24	30,878	5,835	54,779	1	951
Other British East Indies	3	3,784	27	21,045	9	.....	....	.....
Dutch East Indies	15	31,835	3	4,774	11,316	24,636	....	.....
French East Indies	....	.....	....	.....	344	88	....	.....
Hongkong	1	2,350	1	1,335	2,800	3,843	....	.....
Japan	41	75,773	369	329,278	44,915	28,248	4	11,880
Persia	....	.....	....	.....	160	525	....	.....
Siam	....	.....	....	.....	61	64	....	.....
Australia	3	3,757	376	427,677	72,865	78 581	....	.....
New Zealand	3	5,970	231	239,193	51,696	140,000	5	8,577
Other British Oceania	....	.....	....	.....	878	683	....	.....
French Oceania	....	.....	....	.....	1,185	1,035	....	.....
German Oceania	....	.....	....	.....	494	1,592	....	.....
Philippine Islands	23	25,210	222	209,150	25,850	71.090	38	43,523
British West Africa	38	54,138	86	92,297	24,172	16,280	....	.....
British South Africa	....	.....	281	290,825	56,152	35,164	8	7,034
British East Africa	....	.....	....	.....	107	.....	4	6.675
French Africa	....	.....	9	8,475	595	40	91	111,200
German Africa	....	.....	....	.....	250	.....	....	.....
Portuguese Africa	....	.....	2	2,625	.....	.....	....	.....
Egypt	6	3,518	53	31,225	312	805	....	.....
Total	1,359	3,369,581	6,383	6.838,439	4,560,273	2,120,477	1,642	1,489.688
Total for preceding month, August, 1919	1,250	2,537,812	6,283	6,855,277	3,193,431	2,351,064	1,655	1,554,193

Shipments to Non-Contiguous Territory

Alaska	....	.....	2	1.653	4,462	.....	Steam tractors numbering 30, valued at $39,041, were exported to seven countries.
Hawaii	11	23,653	108	92,975	12,964	86.649	
Porto Rico	6	18,545	26	36,093	16,531	82,454	

Current News of Factories

Notes of New Plants—Old Ones Enlarged

TO BUILD STEAM CARS

PITTSBURGH, Nov. 10—The Gearless Motor Corp., Pittsburgh, has acquired property at 117-127 Flaval street, East Liberty, for the erection of a modern assembly building to manufacture steam cars under the MacDonald patents. The plant is expected to be in production in February, according to an announcement recently made to the trade by D. MacDonald, president.

WILL ENTER BODY FIELD

OSHKOSH, WIS., Nov. 10—The J. L. Clark Manufacturing Co., Oshkosh, Wis., a pioneer carriage and vehicle manufacturer of the Northwest, has reorganized itself for the purpose of concentrating on the production of motor car and truck bodies, cabs, etc. The entire plant has been remodeled and re-equipped and the working force increased to 125. At the annual meeting Nov. 1 the following officers were elected: President, H. M. Clark; vice-president, E. M. Clark; secretary and treasurer, W. E. Muir.

RAYMOND CO. TO BUILD

NEW YORK, NOV. 10—The Raymond Engineering Corp., with offices at 309 Lafayette street, New York, manufacturers of Hilton high pressure tire pumps and other metal specialties, have purchased 15 acres of land at Farmingdale, L. I. Work on the first two units of their plant will be started immediately.

The Raymond Corp. has recently closed contracts for their products amounting to over $2,250,000.

U. S. TRUCKS DOUBLE OUTPUT

DETROIT, Nov. 10—The United States Motor Truck Co. will double its output in 1920, according to President R. C. Stewart, who, with Vice-President R. S. Stewart, Forrest J. Alvin, general manager, and E. C. Shumard, chief engineer, spent a part of last week here attending the convention of motor truck sales managers.

PERRY AUTO TOP CO.

COLUMBUS, Nov. 10—The Perry Auto Top Co., has been chartered with a capital of $100,000 to manufacture tops and similar supplies. The concern was formerly a partnership and was purchased by the present owners several months ago. The incorporators are Albert E. Jones, Fred Vercos, Frank L. Dean, George M. Smith and Phillip L. Schneider. The present plant on North Third street will be retained but enlarged.

STRIKE AFFECTS OAKLAND

PONTIAC, MICH., Nov. 10—Oakland Motor Car Co. was compelled to remain closed one day last week as the result of the failure to secure parts due to the strike in the Cleveland iron and steel industry. Shortage of engine parts compelled shutting down of that plant and the resulting shortage of engines forced a shutdown of the assembly plant. This is the first real effect of the strike felt in this district.

VIM TRACTOR BUILDS

MILWAUKEE, WIS., Nov. 10—The Vim Tractor Co., with offices in the Caswell block, Milwaukee, and works at Schleiseingerville, Wis., has awarded contracts for the erection of a one-story brick and steel machine shop and assembling building, 100x200 ft., to be ready about Jan. 1. The plant extension and new equipment will cost about $100,000.

LIBERTY TO BUILD

DETROIT—The Liberty Motor Co. has been granted a permit for the construction of a two-story administration building at a cost of $66,000. Work on the new building will start immediately.

LAST EAGLE LAUNCHED

DETROIT, Nov. 10—The Ford Motor Co. last week "dropped" the last of 60 Eagle boats into the water and the River Rouge plant rapidly is being readjusted for the manufacture of tractors and automobile bodies. The company has for some time been using a portion of the plant in manufacturing bodies.

NEW BRASS FOUNDRY

MILWAUKEE, WIS., Nov. 10—The Superior Brass Foundry, a new Milwaukee corporation with $30,000 capital, has opened a shop at 282 Lapham street.

LAMP FACTORY ENLARGED

CINCINNATI, Nov. 10—The Thomas J. Corcoran Lamp Co. has awarded contracts for the erection of a four-story fireproof addition to its plant on Spring Grove avenue, near the B. & O. S. W. tracks. The cost of the structure is estimated at $250,000, exclusive of the equipment necessary for doubling the capacity of the plant. It is said that when the addition is completed it will be one of the largest plants in the country manufacturing automobile lamps.

MAKES AUTOMOTIVE CASTINGS

BEAVER DAM, WIS., Nov. 10—The Western Malleables Co. of Beaver Dam, Wis., which some time ago entered the manufacture of medium-weight castings for the automotive industries to supplement its original line of railroad and other heavy castings, has decided to convert one of its three large foundries in Beaver Dam for automotive castings exclusively. The changes will cost more than $100,000 and will be completed Feb. 1.

NEW FIRMS INCORPORATE

DETROIT, Nov. 10—The following new concerns have been granted charters in Michigan:

Koss Bros. Manufacturing Co., Detroit, manufacture and deal in machinery, motor valves, automobile parts, accessories, etc., $10,000; Anton Koss, president.

Auto Necessities Co., Detroit, manufacture and deal in automobiles, motor trucks, tires, etc., $10,000; Fred A. Carroll, president.

Auto Specialty Sales & Supply Co., Bay City, Mich., to buy and deal in automobile accessories, $5,000; Allen McEwan, president.

Valley Auto Specialty Manufacturing Co., Bay City, Mich., to manufacture and deal in automobile accessories, $5,000; Allen McEwan, president.

Nevison-Reed Body Co., Detroit, to manufacture all kinds of automobile bodies, $40,000; William E. Reed, president.

Empire Auto Painting & Trimming Co., Detroit, painting and trimming automobiles and other vehicles, $100,000; John A. Matthews, president.

AIRPLANE CO. FORMED

LOUISVILLE, KY., Nov. 10—Articles of incorporation have been filed with the county clerk by the Kentucky Aeroplane & Supply Co., which has a capital stock of $50,000, divided into shares of $10 each. Stanley E. Hubbard, George D. Mattingly, W. E. Mattingly and L. H. Sackett are incorporators.

"GREYHOUND" MAKER BUILDS

CLEVELAND, Nov. 6—With contracts on hand amounting to $6,250,000 and three shifts of employes working eight hours a day, the Ideal Tire and Rubber Co., maker of the "Greyhound" cord tire, is rushing the erection of a large addition to its plant here, according to an announcement by D. C. Hathaway, general sales manager.

"Our present factory with modern equipment and floor space of about 65,000 ft.," says Hathaway, "is turning out approximately 1,000 tires and tubes a day. We have on contract for the coming year 48 large distributers, in addition to having wide distribution among dealers, making it necessary to increase our production capacity at least 2,000 tires a day.

URSUS IN WISCONSIN

MILWAUKEE, WIS., Nov. 10—The Ursus Motor Co., an Illinois corporation with an authorized capital stock of $500,000, has been granted a charter in Wisconsin as a foreign corporation. The sum of $23,000 is set aside in the application as the local investment. Stanislaus Lempicki of Milwaukee is Wisconsin agent.

PLANS TREBLE PRODUCTION

DETROIT, Nov. 10—The Sewell Cushion Wheel Co. plans to treble its production with the addition of a factory on a ten-acre site purchased recently. Work on the new factory will begin at once.

Men of the Industry

Changes in Personnel and Position

JOHANNSON HONORED

DETROIT, Nov. 10—C. E. Johannson, noted Swedish inventor of gauges, was tendered a reception Monday and Tuesday nights at the salesrooms of the Charles A. Strelinger Co., attended by several hundred persons affiliated with the automobile industry. There was no formal program, the time being taken up by the inventor with an explanation of the technical features of his gauges, some scaled to measurements of one-millionth of an inch. The opportunity to see and hear Johannson, whose gauges are used so extensively in the automobile world was accepted gratefully by Detroit automobile men.

W. H. Metz, former representative of the Burd High Compression Ring Co. in the Detroit district, but for the past year and a half in the government service, has been appointed district agent for the state of Iowa, with headquarters at 704 Polk building, Des Moines.

Louis J. Schneider has been appointed general sales manager of the Clark Tructractor Co., Chicago. He severed his connections with the Radiator Co., Lockport, N. Y., to assume his new duties Nov. 1.

H. G. McGee of Des Moines, Ia., has been appointed assistant director of the Bureau of Municipal Research for the B. F. Goodrich Rubber Co. to succeed John A. Roe, who recently resigned to go with the Goodyear Tire and Rubber Co.

V. V. Casey, who has been representing the Northwestern Chemical Co. of Marietta, O., manufacturers of Norwesco "Chemically Correct Utilities" in the southeastern states was recently promoted to eastern sales supervisor.

L. W. Cash, former purchasing agent for the Wisconsin Parts Co., Oshkosh, Wis., is now in charge of the purchasing department of the Turnbull Motor Truck and Wagon Co., Defiance, O.

Earl B. Stone has been appointed assistant advertising manager of the Cleveland Tractor Co., Cleveland, O.

C. E. Williams, for the past two years assistant to H. T. Boulden, vice-president of the Selden Truck Corp., Rochester, has become general sales manager of the Sanford Truck Co., Syracuse.

R. J. Schuler, formerly purchasing agent for the Detroit Gear & Machine Co., Detroit, has been made supervisor of cost production and purchases. C. E. Messerschmidt, formerly assistant purchasing agent, becomes purchasing agent and L. E. Stevens has been appointed assistant purchasing agent.

Capt. Robert W. A. Brewer, consulting mechanical and electrical engineer, has become associated with Joseph A. Anglada, consulting engineer, of Philadelphia.

ENTERS SUPPLY FIELD

NEW YORK, Nov. 12—Edwin H. Loewus, formerly Chandler agent for the Bronx, has entered the automobile supply jobbing field. He has opened an establishment at 254 West 54th street, under the firm name of Edwin H. Loewus, Inc., to deal in automobile electrical supplies exclusively. Loewus spent two years in the Air Service, sixteen months of which were in France.

Waring Sherwood, formerly associated with the Herff Motor Corp., has been appointed advertising manager of the Briscoe Motor Corp., Jackson, Mich.

H. W. Maass, for many years connected with Charles E. Reiss, former Hupmobile distributer, and recently with the A. G. Kaufmann Motor Car Corp., Premier and Fiat dealers, has established a Chevrolet agency at 1455 St. Nicholas avenue, Washington Heights, New York.

Earl Klick, for four years sales manager for the Chicago Tubing and Braiding Co., Chicago, has organized the Klick Tubing and Braiding Co. of Philadelphia, of which he is president and general manager.

Carl J. Schumann, secretary of the Hilo Varnish Corp., Brooklyn, has been elected president of the National Varnish Manufacturers' Association.

E. R. Haight, formerly of Indianapolis, has been made sales manager of the Curran-Detroit Radiator Co.

James G. Dalgleish, former Wayne county banker, and Burt F. Moulton, formerly with Studebaker, have taken the Studebaker agency in Kalamazoo.

Arthur E. Dixon has been appointed advertising manager for the Torbensen Axle Co., Cleveland, O.

John B. Sopher of Philadelphia has been announced as district sales manager for the Acason Motor Truck Co. in the Eastern and Southern territory, with headquarters in Philadelphia.

George R. Wetten and Arvid E. Nissen recently have joined the Hess Steel Corp., Baltimore, as designer and superintendent of the melting shop.

HASTINGS TO HANDLE HUPPS

DETROIT—Don T. Hastings and R. H. Williams will take over the distribution of the Hupmobile in Detroit, Jan. 1, when the contract held by the Smith-Glines Sales Co. expires. News of the transfer of the agency created much comment along dealers' row when it became public last week.

Hastings is a son of Charles D. Hastings, vice president and general manager of the Hupp Motor Car Corp., and is known widely in Detroit both in and out of the industry. Williams is general sales manager of the Studebaker agency in Detroit and is regarded as one of the leading men in the retail end.

LEWIS GETS APPOINTMENT

WASHINGTON, Nov. 10—Professor George W. Lewis has been appointed executive officer of the National Advisory Committee for Aeronautics. Professor Lewis was formerly general manager of the Clarke Thomson Research of Philadelphia.

NEW TOP CO. OFFICIALS

KALAMAZOO, MICH., Nov. 8—The Limousine Top Co., announces a new production manager in the person of C. G. Madson, formerly with the Stewart Co., the Hayes-Ionia Co., and the Wilson Body Co., and the appointment of E. R. Beebe, of Grand Rapids, to the position of traffic manager. Work on large additions to the plant rapidly is being completed and they will be occupied before the end of the year.

OPEN SYRACUSE BRANCH

SYRACUSE, Nov. 17—F. L. Allen, formerly branch manager for the J. I. Case Threshing Machine Co. here, is to enter the selling business.

The new corporation, of which Allen is treasurer and sales manager, is the Crouse Motor Sales Co., Inc., of Syracuse. The other officers are C. E. Crouse, president; P. J. Sheils, vice-president and service manager.

In addition to selling the J. I. Case products, the new company will handle a line of light cars. A modern service department is to be installed, a division of which will be devoted to the tractor.

LAKESIDE FORGE CO. EXPANDS

ERIE, PA., Nov. 12—To meet an increasing demand for its products, the Lakeside Forge Co., makers of drop forged wrenches and tools, has installed 12 new hammers, built an addition to its machine shop and added a complete nickel plating plant as well as greatly enlarging the die and machine rooks.

NEW CHICAGO AGENCY

CHICAGO, Nov. 10—The R. E. Keller Company—a new advertising agency is to be located in the Otis Building, Chicago, Ill. R. E. Keller is well known in the advertising agency field. During the last ten years he has been identified with some of the largest accounts in the country.

Calendar

SHOWS

Nov. 16-23—New York Automobile Salon, Hotel Commodore.

January—New York. International Automobile Mfrs.' Congress.

Jan. 3-10—New York, N. Y. Grand Central Palace. National Automobile Chamber of Commerce. S. A. Miles, Manager.

Jan. 3-10—New York City. Eighth Coast Artillery Armory, commercial cars and accessories.

Jan. 8—Chicago. Airplanes. Manufacturers' Aircraft Association. Congress Hotel.

Jan. 17-21—Cleveland. Nineteenth Annual Automobile Show, Cleveland Automobile Mfrs.' and Dealers' Assn., Wigmore Coliseum.

Jan. 24-31—Chicago, Ill. Coliseum. Cars: Drexel Pavilion, National Automobile Chamber of Commerce. S. A. Miles, Manager.

Jan. 24-31—Chicago. International Amphitheater, commercial cars and accessories.

Jan. 31-Feb. 6 — Kansas City, Mo. Annual exhibition, Overland Bldg. E. E. Peake, Manager.

Feb. 2-7—Toledo, Ohio. Annual Automobile Show, Terminal Auditorium.

Feb. 9-14—Nashville, Tenn. Nashville Automobile Trade Association.

Feb. 21-28—Ottawa, Ont. Motor Show.

Feb. 23-28—Louisville, Ky. Twelfth annual exhibition, Louisville Automobile Dealers' Assn., First Regiment Armory.

February—Chicago. International Automobile Mfrs" Congress.

February—Deadwood, S. D. Annual Show, Deadwood Business Club. F. R. Baldwin, Manager.

March 13-20—Boston, Mass. Annual Automobile Show. Mechanics' Building.

FOREIGN SHOWS

November—Christchurch. N. Z. First National Motor.

Nov. 7-16—London Olympia Motor Car Exhibition—Society of Motor Mfrs. and Trades.

December—Brussels, International Automobile Mfrs.' Congress.

Dec. 1-9Jan. 4—International Aviation Exhibition, Paris, France.

January—Glasgow, Scotland Scottish Motor Exhibition.

February — Manchester, England. North of England Motor Exhibition.

Feb. 22-March 6 — Birmingham, Eng. British Industries Fair.

March—London, Eng. Motor Boat Marine and Stationary Engine Exhibition.

March—Adelaide, Australia. All Australian Exhibition of motor vehicles, airplanes, engines and automotive equipment.

March 1-15—Lyons, France. Automotive Products. Lyons Industrial Fair.

April or May—London, Eng. Commercial Vehicles Exhibition, Olympia.

April 3-May 4—Buenos Aires. Exposition of U. S. manufactures.

Nov. 2-8—Phoenix, Ariz. Tractor Demonstration, Arizona State Fair.

TRACTOR SHOWS

Nov. 22-29 — Jacksonville, Fla. Florida State Fair and Exposition. B. K. Hanafourde, Manager.

Feb. 9-14—Kansas City, Mo. Fifth Annual Kansas City Tractor Club. Guy H. Hall, Manager.

Feb. 9-14—Wichita, Kan. Tractor and Farm Machinery, Forum, Wichita Thresher-Tractor Club.

CONTESTS

Nov. 27—Los Angeles, Cal. Ascot Speedway race.

Dec. 29—Los Angeles, Cal. Ascot Speedway race.

August, 1920 — Paris, France. Grand Prix Race, Sporting Commission. Automobile Club of France.

CONVENTIONS

November — London, Eng. Road Transport Congress and Exhibition.

Dec. 3-5—Cleveland, Ohio Automobile Trade Assn. annual convention.
American conference.

Feb. 9-13—Louisville, Ky. Seventeenth Annual Convention American Road Builders' Assn., Tenth American Good Roads Congress and Eleventh National Good Roads Show.

May 15-20, 1920—San Francisco. Seventh National Foreign Trade Convention.

Heavy Penalties for Detroit Car Thieves

DETROIT, Nov. 11—Automobile thieves in Detroit in future will face a 10-year penitentiary term. Decision to prosecute thieves and even joyriders under a law which became effective Aug. 14, 1919, was reached following a conference between Inspector L. H. Parker, in charge of the automobile recovery squad, and the prosecuting attorney and his assistants.

Under the law, joyriders who simply "borrow" a car and thieves are looked upon as equally guilty, the mere taking of an automobile constituting a felony. The maximum penalty is a prison term of 10 years. Under the grand larceny law, the punishment was limited to five years for persons convicted of thefts and two years for joyriders, with a 30-day minimum punishment possible. The law reads as follows:

"Any person who shall wilfully or wilfully and wantonly and without authority, take possession and drive or take away, and any person who shall assist in and be a party to such taking possession of, driving or taking away of any automobile or any other motor vehicle belonging to another and lawfully standing in any street, alley, garage, stable or other place, shall be deemed guilty of a felony and upon conviction thereof shall be punished by imprisonment in the state prison for a term not less than one year nor more than ten years: Provided, That the provisions of Act 105 of the published acts of 1913 shall not apply to any person convicted of a second or subsequent offense under the provisions of this act."

Act 105 is the habitual criminal law, under which a third conviction carries a maximum of a life sentence.

Increased Output Expected of Saxons

NEW YORK, Nov. 10—Greatly increased production, backed by definitely assured working capital and the elimination of all indebtedness, is expected from the reorganization plans recently endorsed by the stockholders of the Saxon Motor Car Corp. at a meeting held in New York.

The plan furnishes a working capital of between $2,500,000 and $3,000,000 provided for by the creation of a new stock issue of 200,000 shares of no par stock, 60,000 shares of which is exchanged share for share with present stockholders; 120,000 shares will be marketed through an underwriting syndicate and the remaining 20,000 shares reserved for general corporate uses.

"Saxon business has been excellent during the past year," says C. A. Pfeffer, secretary and treasurer. Demands for cars have been greater than we possibly could take care of, and with the new capital which the reorganization plan gives us we will be able to almost immediately increase our buying facilities, which in turn means greater and increased production.

Receiver Appointed for Fulton Truck

NEW YORK, Nov. 11—Charles Lang has been appointed receiver for the Fulton Motor Truck Co., 1710 Broadway, on a claim of $4,045 made by Henry L. Post for material furnished and work done in making bodies and cabs.

With contracts on hand for 1,083 motor trucks which have a selling value of $1,781,535, but without money to meet obligations which have matured, including $1,580 for salaries and wages of employes at the Farmingdale, L. I. plant, Post says the liabilities amount to $250,000. The assets, however, are said to be worth much more and include the fully equipped one-story Farmingdale factory.

The company has submitted its answer admitting all allegations and concurring in the request for the appointment of a receiver.

British to Be Shown Owen Transmission

LONDON, Oct. 17—J. S. Critchley, one of our most experienced motor engineers, whose life has been spent almost exclusively in the trade, and who is a past president of the Institution of Automobile Engineers, is going to introduce the Owen Magnetic transmission in Great Britain, it is reported.

The Owen system has been written about here and will need no introduction to students of motor development.